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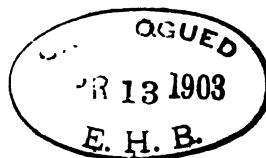
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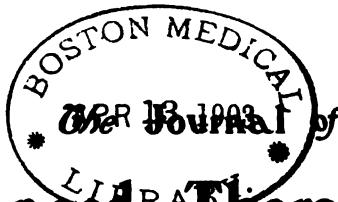
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# Advanced Therapeutics

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VOL. XX.

JANUARY, 1902.

No. 1.

## A CASE OF RECTAL STRICTURE TREATED BY ELECTROLYSIS.

BY WALTER H. WHITE, M. D., BOSTON, MASS.

Ex-President of the American Electro-Therapeutic Association, Member  
of La Société Française d'Electrotherapie, etc.

In looking over our literature for the electrical treatment of rectal stricture very little information is given. The paper by our friend Dr. Newman, in the "International System of Electro-therapeutics," is the most thorough I could find. In most stricture cases the work is slow, requiring a great deal of patience and time in the treatment, and a thorough cleansing of the parts previous to operation. The case of which I am to speak had been under the care of a rectal specialist for over a year, being treated by dilatation with bougies without any apparent improvement.

Miss P., aged thirty-seven years, anæmic; complained of intestinal dyspepsia; had had the grip November, 1898, and later peritonitis; had pains in the left ovary. Sensitive to slight pressure; anteflexion of the uterus, with painful menstruation, with great sensitiveness of posterior wall of the vagina. When questioned about her previous treatment said "that having had a severe attack of dysentery many years previous, which had resulted in the stricture, and later ulceration, local treatment was given, and afterward dilatation was resorted to."

The movements of the bowels were the usual "pipe stem" variety, after either an injection or the use of suppositories given to relieve the pain as much as possible.

The stricture was three and one-half inches from the anus. I said I would try and see what could be done with electricity.

My armamentarium consists of a cabinet battery having the Edison light or continuous current, manipulated by means of

six lamps to control the voltage and amperage, the latter being still further controlled by a water rheostat; it has also a Whitney voltmeter and a Weston milliamperemeter. The electrodes consisted of the Kidder copper and the zinc olive-shaped bulb electrodes, measured in hundredths of an inch diameter, and a large surface pad of 150 cm. dimensions. Owing to the extreme nervousness of the patient I was unable to thoroughly examine with the proctoscope, and was obliged to make use of cocaine solution during the first few treatments.

After a thorough washing out of the bowel with a weak mercurial solution on June 30, 1900, I began treatment, using No. 50 copper olive rectal electrode as the cathodal pole, with the pad at the back for the anode, using the continuous current, 35 volts, 15 ma., taking fifteen minutes to pass through the stricture.

July 5 used No. 54 olive.	35 v.	20 ma.	10 minutes.
" 9 "	58 "	" "	18 "
" 14 "	62 "	" "	10 "
" 19 "	66 "	" "	5 "
" 23 "	70 "	" "	5 "

Then she went on her vacation, which caused a suspension of the treatments.

On October 5 I resumed the treatments as follows:

October	5	No. 70 olive.	37 v.	20 ma.	15 minutes.
"	13	70 "	37 v.	14 "	15 "
"	19	74 "	37 v.	15 "	15 "
"	29	78 "	35 v.	15 "	15 "
November	5	78 "	35 v.	15 "	10 "

Owing to there being so much pain above the stricture, November 12 I changed to No. 66 zinc olive, which could be passed through the stricture easily, to cause a healing of an ulcerated surface above the stricture, the electrode being thoroughly amalgamated with metallic mercury, and using it as the anodal pole with the same strength of current for ten minutes, rotating slightly at times to prevent it adhering to the parts.

November 20 used both treatments—first the No. 66 zinc for ten minutes, then No. 78 copper for ten minutes; same strength of current, viz., 35 v., 20 ma.

November 28, same as above.

December 3, zinc electrode only was used.

*A Case of Rectal Stricture Treated by Electrolysis.* 11

December 17, both zinc and copper, 20 v., 10 ma., 10 min. each.

December 29, same.

January 16, same.

Patient came down ill with tonsilitis, so was away for about a month.

Returning February 16, I insisted on a thorough examination with a proctoscope, finding the stricture with a partially treated ulcerated surface above it.

February 20 resumed treatments, using No. 70 zinc olive amalgamated as before, 20 v., 10 ma., 10 min., for the ulcerated surface, and later No. 78 copper cathodal pole same strength of current. After the treatments I now used a dressing of iodoform gauze, with eucalyptus ointment.

March 11, local application only.

March 18, electrical and local application, the first increased to 35 v., 15 ma.

April 4, No. 84 copper electrode was used, 35 v., 15 ma., 10 min., with local treatment.

April 11, same.

Local treatment with gauze and ointment was used between the last four electrical applications. After April 11 electrical treatment was suspended, and once a week the local treatment with the ointment and gauze were applied until the middle of July. On June 6 she announced she had had her first movement without pain. Examination on July 29 showing stricture enlarged sufficient to pass No. 88 bulb, and the mucous membrane in a healthy state, I pronounced the patient cured.

220 Marlboro Street.

#### DISCUSSION.

Dr. G. Betton Massey of Philadelphia said that the report of this case had interested him exceedingly, particularly the manner in which the details of technique had been given. The situation of the stricture made the case rather more favorable than a case of this kind that had come to him for treatment. The decided success achieved indicated that we had in the method described an absolute cure for stricture situated in the lower portion of the rectum. The treatment was, however, at times attended with difficulty. Some of those present might be familiar with a discussion that had been going on in recent American medical journals as to the existence and importance of rectal valves. One should be cautious about mak-

ing a diagnosis of stricture in view of this fact. He was inclined to think that he had been guilty in the past of looking upon natural valves as strictures. In one case he had made use of albolene to secure dilatation. This had been injected through the ordinary olive tip that had been tunneled, and had enabled him to pass the natural obstructions and reach the others with greater certainty.

Dr. Morse asked if Dr. White had had any other object in using the zinc electrode than to treat the ulcerated surface present.

Dr. White replied that this had been his special object, for he felt that the surface would heal quickly under such an application.

Dr. Robert Newman of New York said that he was exceedingly glad that this subject had been presented to the Association by Dr. White. There was no doubt that other currents were useful in this class of cases, but such current would never dissolve a stricture made up of fibrous tissue. Strictures of the rectum must be absorbed in the same way as strictures of any other part. The speaker said he had had made a bulb on the end of a flexible spiral electrode which accommodated itself readily to the parts. He had electrodes which would pass twenty inches or more above the anus. In treating strictures of the rectum one must consider the cause. If the cause were syphilis, electrolysis was useless; constitutional treatment was alone indicated. If, however, the stricture were the result of dysentery, for example, the electrolytic treatment would be found very effective. In cases of rectal stricture due to carcinoma in an advanced stage there was but little hope of accomplishing much, but electrolysis would cure strictures of a fibroid nature. He had treated a case which a number of physicians had diagnosed as carcinoma. He did not claim to have cured any cases of carcinomatous stricture of the rectum, yet in this instance a cure had been effected in spite of the fact that a government Washington microscopist had said that the growth was carcinoma. A case was referred to in which the patient had been in an advanced stage of carcinoma and was suffering greatly. In this case he had used 50 ma., although ordinarily the current strength which he employed was only 10 ma. This man had improved remarkably under this treatment, so that he could walk four miles, though, of course, death had eventually claimed its victim.

Dr. William James Morton of New York expressed gratification at the character of Dr. White's paper, because it gave others good ground for confidence. Many surgeons of today vehemently denied the possibility of successfully treating urethral stricture by electrolysis, and hence the experiences just presented were very helpful. The speaker said that his

own conviction was that strictures of the esophagus, rectum, and urethra were very properly treated by electricity. Since the last meeting of the Association he had successfully treated two cases in this way. In carrying out the treatment in rectal stricture he had applied the negative pole with from 10 to 20 ma. for ten or fifteen minutes, and had used successive dilatation with the olive. One practical point which he had noted, and which was new to him, was that after the washing out he found he made better progress by employing ordinary dilatation with the olive-shaped bougie for ten or fifteen minutes before resorting to electrolysis. This enabled him to make use of a larger olive bougie than would otherwise be possible. He hoped if this plan proved to be of advantage that it would be given a further trial by others.

Dr. Massey said with reference to the question of using flexible or rigid bougies, that he had experimented quite extensively with the flexible ones. He had experimented with an olive tip about the size of the little finger, and had attached to it a tightly wound but elastic coil of brass wire covered with rubber tubing. This arrangement secured great elasticity, but he found that with such flexible instruments it was difficult in many instances to know the position of the tip of the instrument. Such an instrument was very apt to coil upon itself in the rectum. The most successful instrument that he had used was an olive mounted upon a rigid brass shank, the end to which the electrode was attached being twisted into a rigid spiral having one large turn in about one and a half inches. This instrument was especially valuable in engaging strictures, as the spiral motion that could be given to the tip was an advantage in overcoming the valves. He was disposed to make use of electrolysis even in syphilitic strictures of the urethra, but would use mercury and the positive pole in connection with the copper electrode. He had treated one case of malignant stricture of the rectum, an advanced carcinoma of twelve years' duration. In that case 100 ma. used almost daily with mercury for a period of six months effected a great improvement, and when last heard from, one year later, the patient was alive and well.



## ARMAMENTARIUM AND MODUS OPERANDI OF THE TREATMENT OF URETHRAL STRICTURES BY ELECTROLYSIS.

BY ROBERT NEWMAN, M. D., NEW YORK.

Ex-President of the American Electro-Therapeutic Association, Consulting Surgeon to Hackensack and Bayonne Hospitals, etc., etc.

Strictures, excluding temporary spasmotic actions, are infringements upon the caliber of the urethra, caused by pathological conditions. After inflammations slight pathological changes may be only in the mucous linings, but most cases under the writer's observation were infiltrations of submucous tissues spread in a circle, deep-seated more or less throughout all tissues except the foreskin. This causes fibrous formations and cicatrices, which infringe slowly, but steadily, on the caliber of the urethra from the outside, and sometimes form even abscesses. Such strictures cannot be expected to yield by the different surgical means, and the inflated tissue can only be cured by restitution, which we call an absorption.

Gradual dilatation is an ideal treatment, and may cure simple contraction of the mucous lining, but will not absorb infiltrations and fibrous formation as described above.

Electrolysis is the decomposition of a compound body by electricity—a chemical decomposition. The principles are taught in any text-book on physics and chemistry, and rest on fundamental laws.

The positive pole attracts the acids and the oxygen from the tissues and coagulates blood, and hence acts like an acid on the tissues, and may leave a hard, resilient cicatrix.

The negative pole attracts the alkalies, hydrogen, and the base of the salt, dissolves blood (but forms a plug from froth of the hydrogen), coagulates albumen, and causes absorption.

It acts more like a caustic alkali, does not hurt during the application, and if carried to excess leaves a cicatrix which is soft and not retractile.

The writer has often demonstrated such decomposition with salts like iodide of potassium, etc.

It is also admitted that other factors are present in this action of electrolysis, like cataphoresis, etc. The relative result of electrolysis depends on the strength of the current used and the time of application.

In surgery the rule is: Weak currents will absorb; strong currents must cauterize and destroy tissues.

Consequently it follows that for the treatment of urethral structures we must use a weak current of five milliamperes, or less, of the negative pole from a galvanic battery, and we depend principally on the action of a galvanic chemical absorption. Seances not prolonged and in intervals of one week.

The statement of some eminent practitioners, that in Newman's method of electrolysis "the mucous membrane was burned away as well as the stricture," is absurd and incorrect, to say the least. The gentleman ought to know that an electric current of from three to five milliamperes cannot possibly burn, cauterize, or destroy a mucous lining.

The art of applying electrolysis successfully in surgery consists in:

1. Using the correct strength of the electric current.
2. Applying the respective poles in the right place.
3. Selecting the size, shape, and material of the electrode.
4. Regulating the duration and intervals of seances.

No dilatation!

It is a mistake to say that the action of electrolysis is a dilatation or, as some author remarked, a modified dilatation. It is no dilatation at all, because the electrode is passed by simply holding and guiding it through the stricture. This is done by absorption, and causes thereby an enlargement and restitution of the caliber. The absorption of the fibrous tissues goes on gradually, relieving the stricture and enlarging the caliber of the urethra, until it is restored to its normal size.

The writer protests against electrolysis causing any dilatation, which is an entirely different process, in which always some kind of force more or less is necessary, and force in the electrolytic application is always a fault.

Perhaps it was a spasmodic stricture!

The writer asserts positively that spasmodic action must be treated by other currents, and that galvanism makes the spasm worse. If galvanism cures a stricture, it is a proof that it was an organic stricture.

Reports of success have been given in abundance, patients have been cured by electrolysis and have never had relapses, and have remained well. Some patients have been under observation for over twenty-three years without having had a day of sickness or any relapse.

The Technique.—The president of the Illinois School of Electro-Therapeutics, Dr. C. S. Neiswanger, is an expert in theoretical and practical electro-therapeutics. In one of his writings in the Medical Standard he states: "While a great deal has been said against the treatment of stricture of the urethra by electrolysis, I want to make the statement right here, that as far as his operation is concerned, it has, in my hands, proved to be more successful than any other operation I perform with the aid of electricity. There is a certain technique laid down for the treatment of these cases, the major part of which was given to the medical profession by my friend, Dr. Robert Newman, of New York, and I find that just as long as I follow that technique just so long do I have results similar to those recorded by Newman. Just as soon as I deviate from it I do not have the same good results."

Similar remarks have been made by others, in the press or directly sent to me, which seems to prove that all operations must be understood and executed correctly. As electro-therapeutics are understood now better than years ago, and it has been shown in different ways that the electrolysis will cure urethral strictures without a relapse, if the treatment is correct, the writer has been induced to give his technique, even at the risk of repeating some of that which has been said before.

During more than thirty years the writer has never lost a patient by death, treated by electrolysis, while some patients who left his treatment died after a cutting operation within one week.

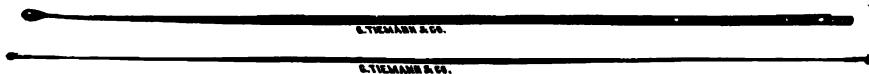
The Armamentarium.—A good galvanic battery, preferably small cells, equally narrow-surfaced elements; the current to begin at zero, to be increased cell by cell without any interruptions, or shocks, so that the patient will hardly perceive the increase of intensity. A rheostat is not necessary. Good cords are with a sufficient number of strands of copper.

Bougie à boule of whalebone, for the examination of the urethra and locating the strictures, different sizes, with an olive-shaped head and slender neck, which adds to its flexibility.

Electrodes.—Four sets, as devised by the writer:

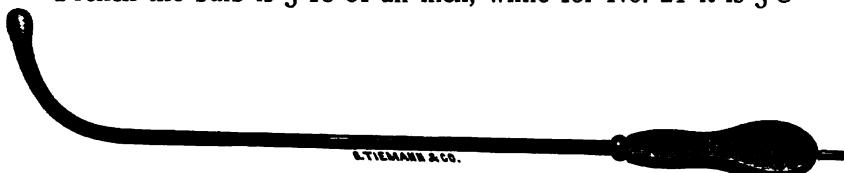
I. The Egg-shaped Set.—The regular electrodes for all ordinary cases have a short curve, an egg-shaped metallic bulb at the working end, while at the upper end there is a round wire

rod for the binding screw of the negative pole of the battery—the only points not insulated and acting as conductors for these extremities. The rest of the electrode must be well insulated, smooth, and without inequalities. I consider a conical bulb



Bougie à Boule.

objectionable in most cases, as we depend on the electrolytic power of absorption, not on force. The length of the bulb is proportioned to the size of the electrode: thus, for No 11 French the bulb is 3-16 of an inch, while for No. 21 it is 3-8



The Egg-Shaped Electrode.

of an inch. The set consists of Nos. 11, 14, 17, 18, 20, 21, 23, 25, 28 of the French scale.

II. The Acorn Set.—These are for use in the first six inches of the urethra in certain cases, and consist of Nos. 15, 17, 20, 22, 25, 27 French. They are without a curve, short, and the bulb is acorn-shaped. Sometimes it is desirable to gain ground by entering the contraction first with the point of the



The Acorn Electrode.

electrode, in order to follow easier with the larger part of the acorn; here this form will do good work. The action of the electrolysis depends on the largest diameter of the bulb in these cases, and does most service on the withdrawal of the electrode when the operator feels best how much work should be done. It is also used when the stricture is near the meatus.

III. The Tunneled Electrode.—These are in Nos. 9, 11, 14, 17, 20, 21, French. They are very important for bad, tortuous strictures, and are to be used only by the expert operator. The curve is shorter, and the egg-shaped bulb tunneled so that

it may be introduced over a filiform guide. When the strictures are tortuous these electrodes are safer, and false passages are impossible.



The Tunnel Electrode.

**IV. The Combination Electrode.**—This is a tunneled electrode combined with a catheter. When a very tight stricture is complicated with retention of urine, the indications are to remove the obstruction and draw off the urine with the same one instrument, as the parts are too sensitive to tolerate the introduction of two instruments in succession. The patient may also be benefited by washing out the bladder, all of which can be done with one introduction of this instrument; but it is ad-



The Combination Electrode.

visible to leave a small quantity of pure water in the bladder, so that this organ can regain its muscular action.

The armamentarium is completed by a few binding screws, some whalebone bougies, olive-pointed whalebone filiform guides, conducting cords, and a milliamperc meter.

The bulbs of all electrodes are just as large as the size they represent, not conical at the end, as the sounds are which are usually sold. This makes a difference of from six to eight numbers between Newman electrodes and the shop instruments, in which the number is expressed by the size at the shaft.

**Modus Operandi.**—First, and a very important matter, is to make a right diagnosis. It must be established without any doubt that it is an organic stricture of the urethra to the exclusion of a spasm of the bladder or any other disease of the bladder, prostate, or urethra. Any other acute disease, inflammation, hemorrhage, or discharge, is contra-indicated to electrolysis. The topography of the urethra should first be well

ascertained, the strictures measured, and a plan for the operation made out accordingly, with a full knowledge of what it is intended to accomplish. The posture which the patient should assume during the operation is immaterial. Anæsthetics are not used, as no pain should be caused, and because the patient ought to be conscious so that he can express his sensations. For ordinary strictures the size of the electrode selected for the operation should be two or three numbers, French scale, larger than the possible caliber of the stricture.

Examine the battery carefully, test the poles, and be sure that everything in the battery is in working order. Connect the electrode with the binding post of the negative pole of the battery, as only the negative pole must be used to the stricture, which causes a chemical galvanic absorption, attracting the alkalies and the hydrogen. The electrode must be lubricated with glycerine and introduced into the urethra until the bulb is arrested by the stricture. A pad electrode wet with warm water and connected with the positive pole of the battery completes the electric circuit. This positive electrode is best held by the patient firmly in the palm of his hand, but may be pressed against any other part of the cutaneous surface of the body. While both poles are held in this manner the galvanic current is slowly and gradually increased one cell at a time, until the patient feels a warm and slightly prickling sensation. The strength of the current must be from two to five milliamperes. Writer uses not more than five milliamperes, but under some circumstances may accomplish all he wants with two or two and a half milliamperes. At this time comes the most important part of the operation—the guiding of the electrode, which must be held steady against the stricture, but gently handled; under no circumstance must pressure be used, so that the absorption must take place by electrolysis. The stricture yields, is enlarged, the electrode slowly advances, passes the obstruction, and sometimes will fairly jump through the stricture. If there are more strictures than one, the electrode should be guided in the same way until it enters the bladder. Then slowly in the same manner withdraw the electrode, pause a little at each stricture, for another dose of absorption, till the first stricture—nearest the meatus—has been repassed, when the current is again to be reduced slowly, cell by cell, to zero;

and not until then is the electrode to be removed. During the whole operation the electrode must be held against the obstruction, all pressure or force being avoided. Any dilation by pressure is a mistake; the bougie will take care of itself, doing its work by the electrolytic action of the current. A séance may last from five to twenty minutes. The average is about ten minutes. Then the urethra should be left alone, and under no circumstance a sound used.

An antiseptic irrigation of the urethra may be used before the operation—in fact, some patients expect it. The séance should be repeated at intervals of one week, each time using an electrode two or three numbers larger than the last one used. As a rule the cure of a stricture takes about two months, on an average.

**Rules.**—Recapitulation of rules, as a safe guide for practitioners who wish to adopt the treatment of electrolysis in strictures of the urethra:

1. Any good galvanic battery will do which has small elements and is steady in its action; the twenty-cell battery zinc and carbon elements is an excellent instrument, and sufficient for the beginner. A cabinet is a more modern fixture.
2. The fluid for the battery ought not to be used too strong.
3. Auxiliary instruments are important to the expert, but not necessary for the beginner. However, a milliamperemeter to measure the current is now imperative.
4. For the positive pole a carbon electrode is used, covered with sponge or absorbent cotton, moistened with hot water and held firmly against the cutaneous surface of the patient's hand, thigh, or abdomen.
5. For the absorption of the stricture the negative pole must be used.
6. Electrode bougies are firm sounds, insulated with a mass of hard-baked rubber. The extremity is a bulb, which is the acting part in contact with the stricture. Four varieties are now in use, as described above.
7. The curve of the electrode should be short; large curves are mistakes.
8. The battery must be in good working order, and tested.
9. All operations must begin and end while the battery is at

zero, increasing and decreasing the current slowly and gradually one cell at a time, avoiding any shock to the patient.

10. Before operating, the susceptibility of the patient to the current should be ascertained.

11. The problem is to absorb the stricture, not to cauterize, burn, or destroy tissues.

12. Weak currents at long intervals.

13. In most cases a current from two and a half to five milliamperes will do the work, but it must be regulated according to the work to be done.

14. The seances should be at intervals, not too frequent in succession, about once a week average; and each lasting from five to twenty minutes.

15. The best position for the patient to assume during the operation is that which is most comfortable to himself and to the operator. I prefer the erect position, although the recumbent or others may be used.

16. Anæsthetics I like to avoid; I want the patient conscious, so that he can tell me how he feels. Sometimes, and exceptionally, cocaine may be used.

17. Force should never be used; the bougie must be guided in the most gentle way; the electricity alone must be allowed to do the work. Avoid causing hemorrhage.

18. During one séance two electrodes in succession should never be used.

19. All strictures are amenable to treatment by electrolysis.

20. Pain should never be inflicted by the use of electrolysis; therefore it should not be applied when the urethra is in an acute, or even subacute inflammatory condition.

21. The electrodes should not be greased with substances which are non-conductors and would insulate.

22. For ordinary strictures, the size of the bougie selected should be two or three numbers (French) larger than the stricture. Since my method has become popular, some instrument makers have sold an inferior and faulty article by the thousand, and very cheap. Some have even manufactured at random instruments which they sell as Newman's electrodes, for which I am not responsible, and deny most emphatically the parentage. I have seen many defective instruments with which nobody could perform the operation correctly. Elec-

trodes in which the metal bulb is screwed to the stem are always dangerous, and should never be manufactured.

#### THE ADVANTAGE OF ELECTROLYSIS.

1. Electrolysis is applicable to all strictures in any part of the urethra.
2. Electrolysis will pass and enlarge any strictures, when other instruments or the skill of surgeons fail, which I have often demonstrated.
3. It causes no pain or inconvenience.
4. It is devoid of danger.
5. It is not followed by hemorrhage, fever, or any other unpleasant consequences.
6. It relieves at once.
7. The patient is not prevented from attending his daily work or business, and can earn his living while under treatment, without restraint.
8. No relapse takes place.

If operators are not successful, the reason may be found in some bad management, the causes of which can be traced to either

1. The operator himself.
2. Wrong diagnosis.
3. Faulty instruments.
4. Meddlesome interference with the patient.

It must, and will succeed in proper hands in every case that is intelligently and judiciously undertaken. The operation itself needs a clear head, a steady hand, fingers which both see and feel, patience and combined expertness of the electro-therapeutic and genito-urinary surgeon.

148 West Seventy-third Street.

## THE USE OF ELECTRICITY IN RENAL DISEASE.

A. D. ROCKWELL, M. D., NEW YORK.

The consensus of opinion undoubtedly is, if indeed physicians for the most part give it any thought at all, that electricity has little, if any, place in the treatment of renal disease. I hope to show in this paper that theoretically it ought, and that practically it does, do good. The five cases that I have to relate, to be followed by a general description of the special method and forms of current used, may seem a very small number as conclusive evidence of the value of the method employed. Small as it is, however, it has taken me six years to get them. The great difficulty is that there is no probability of markedly improving the condition of these patients without long and persistent, and if possible, daily treatment. Not a few other cases of this character have come under my observation during this time, but through lack of confidence or other causes have fallen by the wayside after submitting to treatment through a period varying from a week to a month. In some of these cases there were undoubted signs of benefit, but none of them were of sufficient statistical value to be included among those about to be given.

It may, I think, be assumed that between functional and organic disease of the kidney, between simple hyperæmia and the beginnings of those structural changes that we term Bright's disease, there is no definite boundary line that reveals itself to any of our known methods of interrogation. It may be that most of the cases I have seen, in which great and permanent improvement was noted, were simply conditions of renal hyperæmia active or passive. It is reasonably certain, however, that if any of them could be classed as Bright's disease, they must be put in the category of inflammatory affections affecting the tubules or stroma, rather than those more serious structural changes originating in waxy and cirrhotic kidney. I am not sufficiently optimistic to assert that the course of progressive structural changes in the nerve tissue, as in true ataxia, or the degeneration characteristic of the more serious forms of Bright's disease, can be permanently arrested and cured by this or any other known method of treatment; but I do believe that

by arresting inflammatory action and congestive pressure through heightened circulatory drainage and increased filtration, by removing the inflammatory products which block up the uriniferous tubules, we can do much towards the prevention of more serious and chronic complications, and hasten the recovery of those cases which have not yet crossed the border line of incurable organic changes.

Case I.—Mrs. S., aged forty-five, was referred to me February 23, 1894, by Dr. M. Allen Starr for such form of electrical treatment as I might judge best adapted to her condition. The general health of the patient was not greatly impaired, nor did her appearance suggest severe constitutional disturbance; but, since a hysterectomy some two years previously, her health has been by no means up to the normal standard, and for the past year she had suffered frequent attacks of severe and uncontrollable cephalgia. It was from this nervous condition that she had consulted Dr. Starr, who soon detected the renal source of her distress.

Urinary examination by Dr. J. C. Smith revealed the following conditions: Specific gravity, 1010; albumen, 2 per cent.; urea, 1-2 per cent.; numerous large hyaline and many granular casts. Aside from a proper regulation of her diet and the occasional administration of some simple remedy for digestive disturbance, little treatment was given other than the electrical, which consisted almost entirely of local applications of the high-tension faradic current. Fifty applications were given, extending over a period of three months, the average length of each séance being about forty-five minutes. The urine was examined from time to time, with indications of progressive improvement, and the last examination in June, shortly before the patient's departure for the country, showed a specific gravity of 1018; no albumen; no granular, and only a very few hyaline, casts; urea 1.5 per cent.

The headache had quite disappeared and in every way she had greatly improved. In 1899, five years after, the patient was again examined and found to be in excellent health.

Case II.—Mr. P., aged forty-eight, was referred to me by Dr. A. R. Carman May 8, 1896. The symptoms that first attracted attention, some eighteen months previously, were diminution in the quantity and alteration in the quality of the urine, with general debility and pain in the loins. He com-

plained later of dyspeptic symptoms, which were thought to be due to slight gastric catarrh.

Through treatment, careful attention to diet, and judicious exercise on his wheel, he improved more or less in all his symptoms, but latterly his urine had again decreased in quantity, with a deeper color. He spoke of considerable pain in the back and loins, and of increasing debility. Examination by Dr. Smith showed a specific gravity of 1015; albumen, 5 per cent.; urea, 0.9; with many hyaline and granular casts. No medicine was given, neither did the patient restrict his diet as rigidly as he should have done. The treatment was about equally divided between local applications of the high-tension faradic current and both local and general static treatment.

From May 8 to November 30, a period of seven months, with an interval of rest between August 1 and September 21, some seventy applications were administered, each one from thirty to fifty minutes in duration.

From time to time analyses were made, with varying results, but as in the previous case with indications of progressive improvement. The last analysis of which I have record, made October 27, showed a specific gravity of 1020; urea, 1.8; albumen, a trace; with no granular and but a few insolate hyaline casts.

Case III.—Mr. E., aged thirty-seven, was sent to me by Dr. J. S. Bird of Hyde Park, December 7, 1897. The health of Mr. E. had always been good, until an attack of scarlet fever nine months before. From the renal symptoms following this attack he had not recovered, and for the last two months had grown distinctly worse. The leading symptoms were pronounced albuminuria, and an unusual tendency to fatigue after slight exertion. Ever since resuming his usual occupation he was unable to work more than half time, and for more than a month had ceased to work at all. The specific gravity was 1020, with very little, if any, diminution in the quantity passed; urea, 2.00; albumen, about 2 per cent; with a very few hyaline casts.

As there was no cardiac nor pulmonary disease, nor any discoverable venous obstruction, the condition was diagnosticated as one of passive renal congestion consecutive to scarlatina. The patient was under treatment two months, and received twenty-eight applications, mostly with the static wave current.

An analysis made shortly before the cessation of treatment detected neither albumen nor casts, but the same specific gravity and relative amount of urea as at the first examination. His strength had so increased that for several weeks before stopping treatment he had been working without discomfort the usual number of hours daily.

Case IV.—Mr. D., aged forty-four, suffering from what was subsequently believed to be a chronic nephritis consecutive to calculus pyelitis, was referred to me June 29, 1899, by Dr. Abbott Hodgman of this city. This patient not only failed to permanently recover, but finally developed maniacal symptoms and was sent to an asylum. Nevertheless I regard the case as an interesting one, well illustrating the very positive value of electricity in alleviating the symptoms of chronic kidney disease, and in this case after a multitude of other remedies, external and internal, had been tried and failed. The condition here seemed to be due to a too free use of alcohol, and perhaps also to frequent and continued exposure to cold. The patient's business required him to be up and out in the early hours, and his use of stimulants was confined mostly to these early hours, and taken on an empty stomach.

Symptoms of kidney difficulty developed a year or more before I saw him, and during this time he had been able to attend only irregularly to business. Latterly he had suffered pains of the most severe and persistent type in the back, thigh, and groins, which Dr. Hodgman had found difficult to relieve, because of the profound and dangerous depression following the use of morphine. An examination by Dr. H. T. Brooks revealed strong albumen reaction with Heller's and Esbach's tests; numerous small hyaline, fine and coarsely granular casts, together with epithelial—epithelial—pus; blood and mixed casts; urea, 2.4; 11.52 grs. to oz. Indican, excessive, with innumerable large and small calcium oxylate crystals. Under the daily use of local applications of the high tension, supplemented further on by the static current of alternating potential (wave current), the patient improved in all his symptoms. The excessive pain from which he had so long suffered yielded rapidly, and was soon followed by increased weight and strength. Within six weeks fifteen pounds had been gained, and our patient having the ability and will to walk long distances, it was sometimes difficult to keep him within bounds.

Several subsequent examinations by Dr. Brooks showed varying results, but no great apparent improvement in the character of the urine, until December 6, when the sample submitted was found to be greatly improved.

The albumen, though showing a distinct reaction, was small in amount as compared with former specimens. Urea, 1.2; chlorides, normal; indican, normal; rarely a small hyaline faintly granular cast; few blood or pus casts; few fatty or blood-stained renal elements. Of this specimen Dr. Brooks wrote as follows: "But one-half dozen casts were seen in all, one of them composed of leucocytes (pus) entirely. The blood corpuscles were all isolated, well preserved, and clear, and were very probably responsible for much of the albumen noted. As compared with former specimens the anatomical elements are greatly reduced in number.

This patient subsequently relapsed following certain indiscretions, and the urine again began to show an increase in the number of casts, amount of albumen, etc. Delusions supervened, with homicidal tendencies, leading finally to the commitment of the patient. Incomplete or imperfect metabolism resulting in auto-intoxication is now believed to be a frequent cause of renal disease. The partially transformed products, the result of defective metabolism, fail to penetrate the renal epithelium, and instead of being excreted by the tubules in a normal manner become a direct source of irritation. We thus get what has been termed a condition of renal inadequacy that may lead to serious organic changes. The following case, I believe to be of this character.

Case V.—Mrs. L., aged forty-three, consulted me June 18, 1900, suffering from almost constant cephalgia, frequent attacks of dizziness, scanty urine, with much pricking, itching, and tingling of the extremities. These symptoms began about six months previously, although for some years she had been the victim of periodical attacks of extreme mental depression and hysteria. Several urinary examinations were made, revealing always a very small amount of albumen, with a deficiency of urea, but no casts. Three days subsequently I was hastily summoned to her residence, and found her partially unconscious, with incomplete paralysis of her right arm and both legs. The following day her mind was as clear as ever, and she had in a great degree recovered muscular power in all the

affected limbs. This quick recovery was in itself sufficient to exclude hemorrhage or embolism. Under static vibratory treatment there was an almost immediate increase in the urinary flow to quite double the ordinary amount. The cephalgia, vertigo, together with all the annoying sensory symptoms, gradually disappeared, and at the end of two months, after thirty-eight treatments, she was discharged quite well in every respect, and with no trace of albumen. You will, I think, agree with me that these cases are more than simply suggestive.

Taken in connection with what we find to be a common everyday result of electrization, viz., the regulation and correction of the eliminating process of the body, with nutritional improvement, they demonstrate clearly enough to my mind the therapeutic value of electricity in some of these cases.

In their treatment my efforts were restricted to two methods of administration.

First: By the high-tension faradic current. Flexible electrodes of blocked tin, three inches in diameter and covered with sponge or layers of absorbent cotton are placed over the region of each kidney and firmly bound.

Beginning with séances not more than ten minutes in duration, they may be very gradually or quickly increased, according to the susceptibility of the patient, to three-quarters of an hour.

The strength of the current should be gauged by the sensation of the patient, i. e., it should be given almost but not quite to the point of actual discomfort.

Mild currents are, I am convinced, of little value, and fortunately, with suitable electrodes, and properly placed, the strength that can be easily borne is very great. It is the skin which offers the chief resistance, and is the only seat of pain in the passage of the current, so that it is the epidermis only that we have to consider so far as the sensibility of the patient is concerned. When once the current penetrates the skin, its threads, if we may so speak, diffuse rapidly, and the stronger the initial force, the greater the density of these threads and the more potent their action at any given distance from the surface.

The question then is not how weak, but how strong, a current can be administered without actual pain in order to get the

requisite local effect on the internal tissues and organs of the body.

Second: The static wave current. This was used in connection and alternation with the high tension faradic current. It has the advantage over the last named of exceeding it greatly in frequency and tension; in enabling one to administer a current not indeed of greater magnitude, but of far greater force and rapidity of oscillation, with the minimum of sensory and motor disturbance. Indeed, currents of the highest tension and frequency seem to have neither motor nor sensory effect that are at all appreciable, yet we find as a result of these infinitely rapid vibratory disturbances a marked influence on the circulation and combustion.

On the circulation they have been found to lower the blood pressure at the moment of application, followed by increased pressure and vascularization. As a result we get an active circulatory drainage of inestimable benefit in conditions of passive congestion. Now in the treatment of hyperæmia of the kidney, our aim is to relieve the hyperæmia and albuminuria by quickening its circulation. With less blood passing through the renal capillaries in a given time less fluid is withdrawn from them, and anything which heightens blood pressure and increases renal filtration relieves the burdened organ of much stress and strain. Diuretics are valuable therapeutic agents because they increase blood pressure and augment the quantity of water excreted.

It is on the principle of a diuretic, partially at least, that electricity acts. The increased blood pressure within the glomeruli that follow its use results almost invariably in an increased flow of urine. More important still must be its influence over metabolism, its stimulation and regulation of disordered nutritive exchanges. I have referred to certain advantages of the static wave current over the high tension: its greater frequency and power to overcome resistance without motor or sensory effect, and the general nutritional influence that necessarily accompanies even local applications. When we consider that its voltage and alternations reach into the hundreds of thousands, it is not difficult to understand that quickened metabolism of tissue must be a necessary accompaniment of its painless passage. The simple local application of what we have been accustomed to term the dynamic forms of electricity

do not hasten these general nutritive exchanges as does local static treatment.

In order to obtain this influence over general nutrition, we are obliged to combine with the local treatment by the high tension faradic the older method of general faradization. This method is equally efficacious according to my experience in the conditions under consideration, now that we have at command the high tension coil, but is decidedly more tedious to both physician and patient.

As an offset to this, however, it has the no slight advantage of being available always at the bedside of the patient, and if it does not possess the high potential of the other its magnitude is far greater.

25 East Forty-fourth Street.



## THE CASE OF MRS. D.—A STUDY IN CONTEMPORARY GYNECOLOGY.

BY G. BETTON MASSEY, M. D., PHILADELPHIA.

Ex-President of the American Electro-Therapeutic Association.

The salient points in Mrs. D.'s case run through the whole gamut of modern gynecology, but, unfortunately, Mrs. D.'s case is not here reported because of its unusual character. It is rather as an exemplar of everyday experience that I hold up the mirror to this bit of nature and art.

The picture is not a beautiful one either, when Mrs. D. is first seen weeping because one of the members of her body had been hastily sacrificed. But this need not be dwelt upon, for how many other women are also weeping that gynecology may teach general surgeons the beautiful art of abdominal section?

The medical and surgical history of this case begins, as usual, in painful menstruation. In April, 1893, at the age of twenty-one years, the cervix was dilated by the young surgeon whom she consulted at a hospital. This forcible dilatation was followed, as frequently happens, by the formation of a tender mass in the region of the right ovary. Three months later, while in this condition, she married, her physician advising her to prevent pregnancy for a while, so she states, by the use of douches of cold water.

Marriage at such a time and in such a condition was necessarily doomed to be accompanied by an imperfect development of the new functions incident to the state, in spite of which it seems that pregnancy ensued and was mistaken by her attendant for an aggravation of the ovarian trouble, and, as operation days came around regularly at the college, she was persuaded to have the ovary taken out. This was done three months after marriage, the supposedly inflamed ovary being removed and a significant curettage of the uterus also performed. From that day the patient states she has been a sick woman.

When first seen in clinic by myself the physical basis of her suffering at that time was evident. The left ovary and tube were now in an unhealthy condition, a soft tender tumor about the size of a goose egg presenting in this situation, and she had just been told by the surgeons who operated before that

another operation was necessary, and the remaining ovary would have to be removed.

As the patient was desirous of having children, if possible, I decided to make an effort to cause resolution in the inflamed appendages, believing that the tumor which had caused her advisers to urge her to risk her life again and bring upon herself the consequences of castration was merely a chronically inflamed tube.

The mode of treatment adopted in the effort to produce resolution of this deeply seated morbid process was the well understood vagino-abdominal application of the galvanic current, the positive pole being within the vagina. About 50 to 70 milliamperes were employed three times a week, followed by the faradic current, each current being allowed to flow four minutes. The only unusual feature of the treatment, and one to which I wish to direct your particular attention, was the



use of a bare copper vaginal electrode freely amalgamated with mercury. As this pole was positive, the vaginal surface nearest the tubal region received a considerable quantity of mercuric and cupric oxychlorides by cataphoresis, and, under the repeated applications, much of this highly valuable interstitial alterative must have reached the inflamed adnexæ. Some irritation of the vaginal surface next the ovary resulted, of course, and after three weeks' treatment the applications had to be intermittent for a time.

At the end of two months the tumor was smaller, the diminution being attested by the original surgeon in attendance. Six months later the tumor could not be found, though slight tenderness and some contraction of the parts could be found in its situation. During the treatment the patient reported periods of leucorrhœal flow, probably from the emptying tube, but this source of the attacks of watery discharges could not be verified.

To-day this patient, who had thought seriously of obtaining a divorce from her husband, is in the enjoyment of a happy

married life, clouded only by the continued absence of the proverbial stork.

The lesson taught by this brief study in practical gynecology is by no means confined to the electro-therapeutic efforts and their fortunate results. Many other cases have shown me the danger of forcible dilatation, and I cannot but suspect that this operation aggravated the simple condition from which she suffered. I am led to strongly suspect, also, that the conditions prior to the ovariotomy were simply those of congested ovaries and tubes, aggravated by unwholesome marital relations, and further complicated by the early disturbances of pregnancy. What a need had this woman at that critical time in her history for the wise counsel and judicious treatment which, though not brilliant, is the true glory of our profession.

The thought also occurs that a young married woman seeking advice should receive that careful attention to the healthy performance of newly developing functions that other organic activities receive. Are not some of our works on gynecology in fact "like the play of Hamlet with part of the Prince of Denmark left out?"

1831 Chestnut Street.

#### DISCUSSION.

Dr. Robert Reyburn of Washington, D. C., said that he had been deeply interested in this paper. For years he had been looked upon by the members of his local society as an old fogey because he was not willing to practice or sanction the present fashionable wholesale removal of tubes and ovaries. He looked upon this practice as a crying shame, and thought the association should set its face steadfastly against it. The removal of the uterine appendages ruins the woman's life, and is a procedure which should not be resorted to without a most careful and conscientious consideration.

Dr. S. W. Bayliss of Buffalo congratulated the author on this very practical paper. Cases like the one forming the text of the paper were met with almost daily in general practice. He too believed that the indiscriminate removal of the ovaries was a disgrace to the profession. He thought he had seen ten normal ovaries removed to one abnormal ovary. By the use of the galvanic current in non-suppurative cases the painful pelvic conditions could be almost always relieved, even though it might be necessary to extend the treatment over a period of three or four months. With the high-tension coil

the pain could be relieved immediately—indeed, almost instantly upon adjusting the vibrator so as to secure rapid and smooth vibrations.

Dr. O. S. Phelps asked Dr. Massey what was the diagnosis of the case forming the basis of his paper.

Dr. Massey replied chronic inflammatory enlargement of the tube, but apparently not of the ovary—in other words, it was a hydrosalpinx rather than a pyosalpinx.

Dr. Phelps said that he coincided most thoroughly in the conservative view that had been expressed by the preceding speakers. He recalled an instance in which he had assisted another surgeon in operating upon a case in which one ovary and tube had been converted into a pus sac and the other ovary enlarged and inflamed. As a portion of the latter ovary was still normal he had urged the operator to save it, and this had been done, with the result that he had the satisfaction of having the woman subsequently menstruate regularly. He seldom approached an operation that he did not prepare his patient for the operation by galvanic treatment. His object was to get rid of as much exudate as possible, as this greatly simplified the operation. In many cases in which inflamed ovaries were bound down by adhesions he had had the great satisfaction of relieving the ovary from the pressure of the exudate, and making an operation unnecessary. An illustrative case was cited. The patient was a woman with a supposed fibroid tumor reaching to the umbilicus. She had had hemorrhages for which she had been treated medicinally by the family physician. He had succeeded in checking the hemorrhage by zinc electrolysis, using at the first application 125 ma.,\* and afterward usually from 25 to 30 ma. anodal current for ten to fifteen minutes. After about two months of treatment the tumor had become perceptibly smaller, it being about one-third of its original bulk. He had then been able to map out four small fibroids. The woman at this time did not desire operation if galvanic treatment could complete the cure. He had accordingly continued the treatment, and she had paid him altogether over one thousand dollars, and had been made happy by thus escaping operation. This was truly a most instructive case, but electro-therapeutists should be careful not to carry this idea of conservative surgery too far. Where there was a possible chance to avoid operation the patient should be given the benefit of the doubt.

Dr. R. J. Nunn of Savannah referred to the case of a woman, the mother of three children, who had come to Savannah about three years ago. She had been treated for ovarian pains

\* It should be remembered that such high currents should only be used for controlling hemorrhages and the reduction of fibroid tumors; the time should also meet the indications. For ordinary work in treating endometritis 15 to 20 ma. for five to eight minutes is quite sufficient.

in various cities in which she had been living. Some minor operations had been performed, and she had been advised by some physician to go to a hospital and have some operation performed, the exact nature of which the patient did not know. She had finally fallen into his hands, and he had used upon her the character of current which he had already described to the Association. For several months she had been relieved absolutely of pain. About that time Dr. Nunn said he had been compelled to give up practice because of ill-health, and the woman becoming ill again had been persuaded to submit to operation at a hospital. She had died as a result of it. Another case had recently come under his observation, which was a still more melancholy example. The patient was a woman of twenty-eight, who was subject to certain seizures which, from the description, he took to be hysterical convulsions. The uterus and adnexa had been removed by some practitioner, but the woman was just as bad afterward as before. The speaker said that when he had examined her he had found intense tenderness and soreness of the whole spinal column, extending up even into the occipital bone and mastoid processes. Electricity had not been tried, and a thorough examination of this woman had never been made before subjecting her to this mutilating operation. This seemed to him disgraceful.

Dr. Massey closed the discussion. He said that his object in reporting the case in the paper had been twofold. The case was not an extreme one, and had been presented as merely one illustration of the testimony that we must bear against a dreadful practice now prevalent. The treatment of his case had not been intra-uterine, but altogether vaginal, so that the risk had been comparatively slight. In beginning the treatment of a case having a soft, tender mass laterally, one must bear in mind that such treatment must necessarily be tentative. His other reason for presenting the case was to call attention to the fact that he had used mercury by cataphoresis, and had made a distinct temporary cauterization in the vagina. The method was easy and cheap. He had used in this treatment an old-fashioned brass ball electrode heavily coated with mercury.

## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D.

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## INTRODUCTION.

Although dry superheated air as a therapeutical measure has now been before the medical profession for several years, yet as far as the average practitioner is concerned it is still a new and unknown quantity, and even the latest text-books dismiss it with only a bare mention and only in connection with two or three pathological processes. This is to be deplored, as the agent is one of the most potent and generally useful at our command, and is applicable to many diseased conditions wherein the ordinary methods of treatment are unsatisfactory. Observations of the scientific and systematic application of hot air, however, have of late given rise to articles which are appearing with increasing frequency in the medical journals of this country and Europe, and it is to be hoped that in the near future this element of therapeusis will become as popular in its own peculiar sphere as it is effective.

In the series of articles to which this is introductory the use of this agent in each disease to which it is applicable will be treated at length, together with the attendant phenomena and clinical results, and the advantages accruing from its employment in each individual disease will be mentioned in the section devoted to that disease. In those conditions where drugs or other accompaniments can be advantageously employed they will be mentioned and illustrative cases cited. It is intended that the physician who reads these articles shall be able thereafter to prescribe hot air in such a way as to secure beneficial results for his patient, and to know where to locate the trouble if benefit does not follow.

For its actual administration the acquisition of a certain amount of technique and familiarity with the phenomena induced is of course as necessary as in any other special forms of treatment, but with a good apparatus, some intelligently

directed pains-taking, and experience any physician can get results which will more than repay him for the trouble involved. It is not expected that every physician will become a hot-air expert, but every physician should at least understand the principles of its application and its effects, and be able to decide when his patient will be benefited by it. Then if he does not care to undertake its actual administration he can send his patient to someone who is expert, of whom there should be two or three in every community.

Many of the failures to secure results with dry hot air are due to the fact that the prescriber, who is usually at present also the operator, has not this knowledge, and expects the agent to give results in conditions to which it is not applicable; for instance, calling upon it to cure appendicitis because of its remarkable efficiency in peritonitis. Other failures are due to improperly employing the different methods of giving hot air, as when local treatments are called upon to cure arthritis deformans, whereas treatment of the whole body at once for its effect upon the sympathetic spinal centers is the only efficient and proper thermæro-therapeutic measure. Still other failures are due to lack of thoroughness, as when the temperature of the treatment in a given case is stopped at 250° F., when it should be carried to 400° F. Failures because of errors in diagnosis also deserve mention, a very common instance of which is exhibited in the mistaking of arthritis deformans for rheumatism. The method of applying hot air for rheumatism is very rarely of the slightest benefit in arthritis deformans, and frequently aggravates the trouble.

It will readily be seen from these remarks that for the successful employment of dry hot air it is not sufficient to buy an apparatus and go to "baking," but that for the operator a thorough knowledge of and extended experience in its use, and for the prescriber at least a good knowledge of its applicability, physiological action, and curative results, is absolutely essential.

These conditions attained, however, it becomes one of the most useful and satisfactory of therapeutical measures. Finally, we must not expect hot air or any other one measure to be an universal panacea. It will alone and unaided cure some disease conditions; others will require all the therapeutical resources at our command, and in still others even all that we

have will not suffice to produce a cure. Its powers, however, are exerted in a direction in which we have hitherto been very deficient, its addition to the treatment results in benefit to many patients who would fail to improve under other measures alone, and its adoption into our armamentarium enables us to increase by a large percentage the sum total of our power over disease. Any agent possessing these attributes is entitled to profound respect and extended study. Dry hot air possesses them in an eminent degree.

## CHAPTER I.

### PHYSIOLOGICAL ACTION. •

**Local Treatment.**—As its name suggests the action of the local treatment is practically confined to the part treated. The effect upon the organism as a whole is slight, and principally secondary to changes induced in the disease focus; hence it is not capable of curing unaided pathology which owes its origin directly to impairment of the central nervous apparatus. For instance, local treatments will not cure the joint lesions of arthritis deformans, although they will in some instances relieve the pain temporarily, because these lesions are manifestations of impaired trophic centers. In rheumatism, however,—and by this term I mean true inflammatory rheumatism,—the primary focus of infection is in the joint or joints affected, and local hot-air treatments with appropriate drugs will usually produce a radical cure. The organism at large will be secondarily benefited by the lessening of depression due to pain, rheumatic toxins, and faulty products of metabolism, in proportion as the local lesion improves.

The general body temperature and pulse are rarely much affected. Patients frequently exhibit an increase of half a degree or a degree in temperature and eight or ten beats of the pulse, but nothing to affect general metabolism markedly as is the case with the body treatment. The local phenomena, however, are marked, and consist of intense injection of the affected capillary areas and profuse sweating, which secretion is strongly impregnated with fatty acids. This impregnation is detectable whatever the disease for which the patient is being treated, or even if he has no disease at all, demon-

strating that it is due to direct stimulation of the secreting structures in the skin.

The primary physiological action of the local treatment is made up of two parts: a direct stimulation of the cell metabolism in the part, induced by the raising of its temperature, a reflex acceleration of metabolism through the spinal centers due to the action of the heat upon the numerous nerve endings in the skin, causing and accompanied by a greatly increased blood supply, the phagocytic and reparative properties of which have been further increased by raising its temperature; and secondarily an improved tone of the organism at large, which of course benefits the diseased part proportionate to the betterment of the local condition. In diseases characterized by the presence of pathogenic micro-organisms in the part treated, as, for instance, in septic infection or pneumonia, still another element appears, viz., the inhibitive influence exerted through raising the temperature of the part upon the growth and activity of the germs, thereby rendering them more susceptible of attack by stimulated leucocytosis and cell metabolism. Some germs are extremely sensitive to thermal changes—the pneumococcus, for instance, being entirely inhibited by only a slight rise in the temperature of its pabulum. Lastly we will mention in this connection its remarkable power of relieving pain and swelling, which is of course dependent upon the relief of stasis in the part. It will be observed that all of these results tend to greatly increase the absorption and assimilation of remedies at the seat of the disease.

**Body Treatment.**—The physiological action here is predominantly reflex through the spinal sympathetic, the area of skin treated being so great that the capillary circulation is able to dissipate the heat before it penetrates deeply enough to exert its action directly, as is the case in the local treatment. The whole spinal sympathetic and trophic ganglia, that control the regeneration of cell structures, are affected.

The mouth temperature rises from two to five degrees Fahrenheit, the pulse increases from thirty to fifty beats per minute, and is markedly increased in volume. If it was weak before treatment it now becomes strong. If treated too long it usually loses its volume and strength, becoming rapid, small, and soft, but sometimes retains its volume, becoming very soft and slow. Under these conditions the patient becomes dizzy,

faint, and nauseated. The respiration deepens and the rate increases five to ten cycles per minute, but is not accompanied by any oppression—rather the reverse, in fact. The patient reeks with perspiration. The capillary areas become greatly injected. The fact that the capillaries of the face, which is never subjected to the heat, share this general distention, even when constantly under the influence of the breeze from an electric fan, demonstrates the profundity of the reflex obtained.

The sensation is not disagreeable to the patient, but quite the reverse usually. A pleasant languor ensues after about ten minutes, and lasts for an hour or two, and the patient usually becomes drowsy and sleeps. If the treatment is continued too long the languor gives place to exhaustion, with cardiac palpitation and oppressed breathing, which sometimes persists for hours.

By this profound stimulation of the trophic centers we secure a more rapid and complete oxidation of effete materials which are clogging metabolic processes, into normal excretory products, urea for the kidneys, CO<sub>2</sub> for the lungs, etc., which are then easily disposed of by the appropriate organs; and a rapid production of vigorous and healthy cell elements, which are much better able than their predecessors to resist toxæmia and microbic invasion. We thus not only obtain a corrective influence in nutritional disorders whose origin is in the sympathetic, but if the patient is suffering from an infectious invasion we increase vastly the resisting power of his phagocytes and tissue elements. The profuse perspiration carries out with it also a certain amount of ptomaines, and thus assists in relieving the depression of nerve centers due to systemic toxæmia.

It will be seen that the physiological action of hot air is in line with that of the Turkish bath, electricity, and massage, but is under some conditions much more profound than any of them. It is, however, usually advantageous and, as will be seen later, sometimes necessary to combine electricity with hot air in order to accomplish certain results. Neither alone will do the work of both together. Massage in the same way is sometimes useful, but very rarely necessary.

67 Grove Street.





FREDERICK H. MORSE, M. D.,  
MELROSE, MASS.,  
*President of the American Electro-Therapeutic Association.*

## **Editorial.**

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### **PHYSICAL THERAPEUTICS.**

**S**CIENCE develops with advancing time greater accuracy of detail and finer discrimination of fact leading on to a fuller revelation of truth.

Of this there is ample exemplification in the growth of medical knowledge. The microscope has enabled the physician to study tissue histologically, differentiate pathological conditions, and discover the micro-organisms characteristic of many forms of disease.

The practitioner is enabled to trace with increasing accuracy the relation of cause and effect. Empiricism, the offspring of superstition and uncertainty, is passing, and we are approaching nearer the time when medicine shall be an exact science, dealing with the material side of man's existence. With the development of rational medicine the physician learns more and more to appreciate the natural forces essential to life—light, heat, water, and the other chemical constituents of the body.

The tendency toward a more conservative use of drugs, with a growing disposition to give attention to the regulation of habit and environment, and the employment of the energizing forces of nature—heat, light, and electricity—for the treatment of disease, is the sign of scientific progress.

The limitation of the power of the physician or surgeon to combat pathological conditions become less as the science develops, and means and measures are perfected. The forms of physical therapeutics are at least as certain and definite in their action, when intelligently employed, as surgery. Their properties, in full accord with nature's physical and physiological laws, are safe, certain, and effective, and hence eminently successful.

Prestige for these methods is already well established, the conservative skepticism having so far disappeared that those

alone, who for reasons do not thoroughly investigate, constitute the opposition. In other words, opposition is the sign of ignorance. In the employment of every method there are specialists, but the province belongs to the general practitioner as well. There are many who are able to present the subject intelligently and without undue prejudice, and who stand ready to extend the knowledge, making clear the scope of the utilities in each field,—to such the columns of Advanced Therapeutics are ever open.

\* \* \*

#### ANNOUNCEMENT.

With this issue we succeed the two publications,—The Journal of Electro-Therapeutics and The Lancet,—under a new name and régime.

Advanced therapeutics is a departure from the features of both, but it will be our earnest endeavor to place before our readers valuable matter of interest to *all* physicians. When it is recognized that it is possible by this means to enlarge both the scope and size of the publication, we trust that our readers may find the change a satisfactory one. The electro-therapeutists will find as much literature upon the subject as was formerly contained in the older journal, and much upon kindred topics. The increasing interest in the employment of electricity which has been awakened by the discovery of the properties of the Roentgen ray, and the application of the improved electrical facilities, combined with the other subjects of more or less universal application, we believe will be acceptable to the readers of the Lancet.

With the various departments we have associated coworkers whose names are an assurance that valuable contributions are forthcoming, and that what appears will be reliable in character.

In addition we ask the co-operation of a great conservative profession in a field which is of mutual interest.

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WE take pleasure in presenting on another page the portrait of Dr. Frederick H. Morse, the president of the American Electro-Therapeutic Association.

## Progress in Physical Therapeutics.

### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### FOREWORDS.

THE general aim of the gynecological department of this journal will be the forceful presentation of the claims of electro-gynecology to the attention of both specialists and general practitioners. It is probable that no other specialty is so largely practiced by the progressive family physician as gynecology. It is our purpose to bring to his aid all the practical suggestions that the world's current electro-therapeutic literature contains. If we shall help him to restore his patients to health, our mission to him is accomplished. If we shall help him to a broader view of his aims and purposes in gynecology, our mission to advance science is not neglected.

To the specialist in gynecology the recent applications of electro-therapy teach the lesson that his work is not a matter of mere joinery and ablative surgery. However often these mechanical arts may justly be required by the true exigencies of the case, a far more frequent demand is made upon him to restore organic tissue integrity in its histologic sense, and thus enable the organs involved to perform their functions properly. That this view of our duties as physicians requires reiteration is one of the consequences of the still new and fascinating art of pelvic and abdominal surgery, and illustrates the need of an inquiry whether we ourselves are entirely free from the tendencies that produced the great waves of half truth or sheer error that have marked medical history.

In addition to the presentation of abstracts of the current literature of this department, an effort will be made to discuss important developments from time to time. Inquiries and letters detailing cases will be welcomed from our readers, and replies will appear in the next issue after their receipt.

**EYE, EAR, NOSE, AND THROAT.**

EDITED BY W. SCHEPPEGRELL, A. M., M. D.

*The Electro-Cautery in Turbinal Hypertrophies.*

In the discussion of a paper entitled "A New Technique for the Reduction of Turbinal Hypertrophies," by Dr. M. A. Goldstein of St. Louis, before the recent meeting of the Western Ophthalmologic and Oto-Laryngologic Association, the use of the electro-cautery in this connection was discussed. Dr. Goldstein believes it insufficient in advanced cases, and advocates the submucous application of chromic acid by means of a special trocar which he has devised.

Dr. Ballenger of Chicago favors the electro-cautery, and believes that his results were better when he used it more frequently.

Dr. Pierce of Chicago has always been conservative in the use of the electro-cautery, and believes it to be too valuable a method to be discarded.

Dr. Pynchon of Chicago uses it only in well-marked cases, but when required he applies it vigorously, while Dr. Knapp of Vincennes has ceased to use it because he has obtained better results from the operative methods.

This discussion, as well as the general literature of the subject, shows that the electro-cautery has been indiscriminately used in the past years, and that the pendulum in its return swing is advancing beyond the "happy mean." The electro-cautery is a valuable expedient in well-marked cases of turbinal hypertrophy, and when skillfully applied undoubtedly yields excellent results.

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*The Effect of Flashes of Electric Light on the Eyes.*

Three cases of injury to the eye by intense electric flashes are reported by Dr. Dunbar of Atlanta, Ga. (Medical News). Vision was usually lost for a few minutes after the flash, but gradually returned. Redness and swelling of the lids, accompanied by a burning feeling, followed, and a zone of injection appeared around the cornea. Pain developed later, which was relieved by the instillation of cocaine and atropine and by hot fomentation. The milder cases recovered, but in some instances impairment of vision remains, owing to pigmentation in the region of the macula.

Dr. Dunbar also objects to the use of incandescent electric lights for reading and writing.

## DERMATOLOGY.

EDITED BY J. D. GIBSON, M. D.\*

TWO years ago a department devoted to the treatment of diseases of the skin in a journal of this character would have been barren of both data and method, but now there is no field of medicine which offers greater encouragement in the treatment of a class of affections so long stubborn to all methods of local and constitutional administrations.

Finsen's employment of the focused actinic rays of the sun has proved so successful in the treatment of lupus that it is no longer a matter of speculation, but an accepted fact in therapeutics. But Finsen's method of treating this affection is no longer the only one which will obtain the same or, perhaps, better results. A safe and effective, and we believe more rapid, method is by employing the brush discharge either from one pole of a high-tension coil or a static machine. The same means effect most satisfactory results in the treatment of eczema, herpes zoster, favus, and many other stubborn conditions of parasitic, nervous or constitutional origin. The writer's experience confirms a large array of evidence, and of the truth there can be no question.

The success of so many eminent authorities in the use of the Roentgen ray for the treatment of both lupus and epithelioma no longer leaves doubt that in it we have a means of accomplishing the long-sought purpose of combating, at least to a great extent, the terror of some of humanity's greatest scourges. The employment of these means requires relatively so little skill that there is reason to hope that the blessing will become widespread. This department will be devoted to making clear the methods, and thereby enable those who have the apparatus to carry it out.

Reports of cases are acceptable for publication in these columns, and should be accompanied by the detailed description of case and treatment. If the Finsen method is employed, state all the particulars as to apparatus, duration, and frequency of sittings, etc., etc.

If the case is treated by the X-ray, state quality of tube,

\* To take charge of the new department with the next issue of the journal.

distance of exposure, duration, frequency of administration, and description of screens, if one is employed. If the brush-discharge is used, describe apparatus, extent of surface treated, time employed, etc.—Ed.

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*Lupus Vulgaris Treated With the Static Brush-Discharge.*

The following interesting case of lupus vulgaris is reported by Dr. J. D. Gibson, Birmingham, Ala.

The patient, a negress twenty-one years of age, belonged to a family in which there were several cases of tuberculosis. She was apparently in good general health. Was first seen by the writer ten years ago, and treated unsuccessfully; since that time she has run the gamut of all of the physicians and clinics in the city, constantly going from bad to worse. On my return from a sojourn of several months in Vienna I recognized, as I had not before, the true nature of the disease, and concluded to try the electric brush-discharge upon the case, as it had become so extensive that the usual method of curettage seemed almost hopeless. It extended from both supra-orbital ridges to the mouth below, and from one inch in front of the ear on one side to a like position on the opposite side, covering a surface roughly estimated to be five by nine inches in area, the nose and upper lip were the sites of deepest ulceration, and were wonderfully swollen and were covered with foul close-sticking crusts. The cheeks were much swollen also, and covered with thin, closely adherent crusts and patches of scar tissue interspersed with multitudes of tubercles. She was the most horrible-looking object I had ever seen. On the night preceding the first treatment I ordered the crusts to be soaked with oil, and in the morning by rubbing and gentle friction they were removed. The patient was then placed upon the insulated platform and connected with the negative side of the static machine, and a pointed wooden electrode (soft maple) connected to the grounding chain was then brought as close to the face as she could bear it, and a powerful brush discharge was kept up for from fifteen to twenty minutes, the electrode being moved about in order to expose the entire diseased surface to the application. The administration was followed by such a marked reaction, the face becoming sore and irritated, that it was impossible to make more than two applications weekly. The improvement was marked from the first treatment; and progressive. In all twenty applications were made; then followed a period of humidity, and the treatments became irregular and finally were discontinued. Three months later she was seen, and the improvement had progressed to a condition of complete cure, except a small area over the right eye, which is free from crusts, but slightly swollen. This is probably due to the fact

that she shielded her eye from the brush discharge. A few more applications to this spot and the cure will be complete. The skin over the whole area now looks like numerous small scars, as from a burn, and the skin is as soft and pliant as an infant's. Where the ulcerations were deepest, on the tip of the nose and alæ, the surface is white, which shows a marked contrast with the surrounding skin, which is very black.

In this method we have a very potent agent, which merits a thorough trial in lupus and other stubborn diseases of the skin.

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*Chronic Eczema Treated and Cured With Static Electricity.*

Dr. H. B. Maben of Kingston, N. Y., reports the following:

The case was obstinate and of long standing, located at the elbow joint, and extending down the forearm, with deep fissures, and at times accompanied by intense itching, and burning pain.

Static electricity was applied from the wooden-ball (soft maple) electrode in the form of the brush-discharge, to allay the itching, and the long sparks from the brass ball to relieve the burning pain, alternating one with the other daily, and a complete cure was effected within a month.

[Many cases treated with the brush discharge have been cured.—Ed.]

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*The Lortet-Genoud Lupus Lamp.—Its Construction and Technique of Its Employment.* From the Journal of Physical Therapeutics, October 15, 1901.

Doubtless Finsen's method of treating lupus is the best, but its disadvantages are:

"(1) The length of time necessary to carry out the treatment."

"(2) The very large amount of current (70 to 80 amperes) required. The Lortet-Genoud lupus lamp removes the hindrance.

"The lamp is a continuous current arc, taking a current of 12 to 15 amperes and from 55 to 65 volts. The negative carbon is 12 mm. in diameter, positive 8 mm. They are inclined toward each other at an acute angle. The carbons last for four or five sittings, and are easily removed and replaced by pressure on small levers. The arc itself is regulated by a system of screws." Between the light and the patient there is interposed a screen formed by a kind of metallic vessel, in the interior of which there is kept up a constant circulation of water to obviate heating. This metal vessel, which serves both as a screen and a container for the circulating water, has a central orifice which allows the light to pass through it, this orifice being in its turn closed by a kind of hollow ob-

turator, whose two faces consist of quartz lenses. This obturator [one of whose faces is intended to be in close contact with the skin, exercising compression thereon] has a constant circulation through it of cold water, and the tissues in contact with it are thus submitted to a constant refrigeration. The luminous rays from the electric arc fall upon the surface to be treated only about three or four centimeters from their source of origin, having undergone no concentration."

Treatment should be commenced at the outer edge of the affected surface. Suppurating surfaces should be avoided until suppuration is checked. If crusts be present remove them either mechanically or medicinally. Apply essence of cloves to scaly surfaces to secure transparency. Sterilize the part selected for treatment and use pads and bandages for protection or to guard against compression. Select your compressor with regard to the size or shape of the part to be treated. Fix it in front of the orifice of the screen.

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The carbons must be arranged so their extremities meet. Draw the mirror back so it is not in contact with the carbons. Adjust the apparatus with regard to height and position, the compressor being in "perfect contact." Turn the current and approximate the carbons. "The carbons now in contact are immediately separated a little, say 5 or 6 mm., allowing the crater of the positive carbon to be completely uncovered. The luminous point is then moved forward to a distance of 2 to 4 cm. from the compressor. The arc ought to be upon the prolongation of the axis of the compressor, the crater of the positive carbon being slightly above that axis."

The part treated should be pressed firmly against the compressor. Approximate the carbons according to combustion, "about eight to ten times for a sitting of quarter of an hour." The first applications should last from eight to ten minutes, later fifteen minutes. The time varies according to the patient's susceptibility, the part treated, and the intensity of the arc. At the close of the treatment cover the surface with boric vaseline and boric lint. Keep it in an aseptic condition.

A.-S.

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#### *Roentgen Rays in the Treatment of Diseases of the Skin.*

An article of special interest to the dermatologist is found in the Journal of the American Medical Association for September 28, 1901, by William Allen Pusey, A. M., M. D., Chicago.

He considers Roentgen rays useful "in the following conditions: (1) In conditions where it is desired to produce an atrophy or partial atrophy of some of the appendages of the skin, as in hypertrichosis; (2) in myotic diseases, such as tinea tonsurans, favus, and sycosis; (3) in chronic inflammatory affections, such as indurated patches of eczema and lupus

erythematous, where the purpose is to stimulate the tissue and cause absorption of inflammatory products; (4) in certain specific affections, such as lupus and epithelioma, where the purpose is to cause the destruction of tissues of low vitality." The technique of "Schiff and Freund" was used. He considers the active rays of the X-rays as identical "with the rays at and beyond the violet end of the spectrum." A.-S.

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## CONSTITUTIONAL DISEASES.

EDITED BY FRANCES H. BISHOP, M. D., WASHINGTON, D. C.

THE object of this department is to bring before the readers of Electro-Therapeutics from time to time the therapeutic application of electricity to the great number and variety of diseases known as nutritional or constitutional. The direct current will be discussed in these cases, when indicated, on account of its known chemic, electrolytic, and catalytic action; also its power to tone or stimulate, as occasion requires, the higher nerve centers in the brain and spinal cord, its action upon degenerate nerves and muscles, its soothing and pain-relieving, as well as curative, influence upon inflamed nerves, together with its therapeutic application to the viscera.

In fact, this current is so useful in such a great variety of cases that it will be often mentioned in this department with a full description of the methods of application.

The faradic or interrupted current will be considered for its superior influence upon certain conditions, as in detecting anæsthetic areas, with the dry-skin electrode and fine wire coil, and with the same electrode and coil stimulating peripheral nerves and attracting blood to certain areas, thereby directly and reflexly restoring sensation to a part requiring it. The long fine wire coil is well known for its powers in relieving superficial pain; the coarse wire coil and fine vibrator for its power of contracting muscles through their peripheral nerves, thereby increasing metabolism and restoring the functional activity of weak muscles, and, together with the galvanic current, detecting the reactions of degeneration is valuable. With the slow vibrator we have a most excellent method of contracting, without discomfort, the deep muscles, as well as a massage for the intestines, etc., etc.

The static machine, when a patient can get to the office, per-

forms many important functions for this department, and will be frequently discussed, as well as the methods of applying the same, both in functional and organic disease, the static cage and the ozone bath and inhalations of ozone for certain diseases of the lungs and air passages, the spark for its nutritional action upon diseased joints, and in certain painful conditions, the wave current for relieving pain and bringing about nutritional changes, etc., etc. Every effort will be made to state facts as they arise.

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*Blood-Poisoning Successfully Treated by Electricity.*

The Medical Arena for October, 1901, reports a very interesting case by A. M. Hutchinson, M. D., and in this case the doctor himself was the patient. After pricking his finger on Saturday morning, and forgetting the same, he attended that afternoon a case of lymphangitis. From the lymphatic glands of the leg exuded a foul discharge. In handling and treating the leg the doctor's pricked finger became a focus of inoculation. By bedtime of the next day the finger was very painful, the axillary and other lymphatic glands were tender, and had already begun to swell. In spite of the local use of antiseptic and internal remedies his pain and general condition grew steadily worse, and by morning of the third day the hand and arm were swollen, the lymphatics of right side enlarged and painful. A broad scarlet streak passed up the arm to the axilla and across the back of the neck in the region of the seventh cervical vertebra and down the left side of the spine to the region of the left kidney.

Monday morning the galvanic current was applied, the hand being in a water bath as the positive pole, with the negative at the elbow; temporary relief followed. In the afternoon he grew much worse, and during the night was delirious. In the morning a needle attached to the negative pole of a fifty-cell galvanic battery was thrust deeply into the finger at the point of inoculation. Electrolysis, with the full capacity of the fifty-cell battery, followed for about one minute. After this treatment the pain and swelling subsided. Then strong galvanic currents were passed through the inflamed lymphatics by means of surface electrodes. For a week after he received daily electrical douches high up into the bowel. His recovery was rapid and complete, and dated from the moment of receiving electrolytic treatment at the point of infection.

[Thus is welded one more link in the chain of evidence in favor of the antiseptic and germ-destroying properties of electricity, as well as its favorable constitutional effects.—Ed.]

## THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D., BOSTON, MASS.

**I**N this special department will be considered the use of electrical-therapeutics in those diseases of the alimentary canal where it can be made of especial use, either alone or in connection with other branches of our *materia medica*. We do not propose to advocate its use unless it has been demonstrated of sufficient benefit to warrant its employment, and consider it not to the exclusion of other forms of physical therapeutics. We trust we shall be found on the conservative side, at the same time being ready to advocate its use in new and original forms when results warrant, and shall try to give as detailed an account as possible, so that others can make a successful use of it in their practice.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

**I**N assuming the department of Genito-Urinary Diseases Treated by Electricity in this publication, the writer proposes to cite any article published in the current medical literature for the benefit of the readers of this journal, without regard to the literary merit of such. Some will be mentioned only by title, others given in abstract, and some may be accompanied by an argument, if the writer has a different opinion or idea on important matters. However, discussions or diversities of the author's will be avoided as much as possible, as the intention is only to keep our readers wide awake on the literature of our subject. Original articles and individual experience may be written occasionally if the editor desires it. A prominent feature must naturally be the treatment of urethral stricture by electrolysis; also other surgical procedures and affections in which the electricity is used as a therapeutical agent on account of its electrolytic properties.

It is agreed that there is only one kind of electricity, but

there are many ways to apply it by different apparatus, ways, technique, machines, auxiliary instruments; particularly the strength and manner of the current, which may be continuous, alternating, oscillatory, convective, etc., with many alterations in regard to measures of voltage and amperage. The apparatus, the strength of the current, the particular combinations and technique, and other factors must be selected with great care and understanding in order to make the result a decided success; but such it must be, if the treatment is correct, according to natural laws of physics.

The writer has successfully used his method of electrolysis in the treatment of strictures in about 2000 cases, which is not a large number for more than thirty years' active service, as it would average not more than 5 cases per month. Seven years ago he published a compilation of 1755 successful cases in the practice of fifty-four different operators, mentioning their names, and favorable opinions of the said method. In the same number of the journal in which this was published appeared an editorial from which the following is quoted: "The statistics accumulated by Dr. Newman, if all were reported, would cover a list of over two thousand cases of urethral stricture treated by the electric method. In the face of such a mass of positive evidence one is tempted to explain the dissent existing, by the application of the personal equation. Still, everyone has his right of opinion and free expression; and if the opponents of this method desire it, the columns of the Times and Register are equally at their service." No statements of dissent have been sent; the writer gave documentary evidence for everything stated, which was investigated and found correct by an impartial committee. Many of these patients have been kept under observation, have been re-examined after years, and no relapse followed. Most of these, after twenty-five years' interval, can be found to-day stating that they have kept well without having had a relapse. In a few instances a patient returned after years with a new ailment, mostly of the prostate or bladder, but never had a stricture in the same place which had been cured by electrolysis. During these years the writer has never lost a patient by death while under treatment for a stricture.

Death, however, followed in every instance when a patient gave up the electrolytic treatment by the writer for the sake of

undergoing a urethrotomy, which in these cases was never performed by the writer, but by most skillful surgeons of unquestionable ability who did the work well. The operators cannot be blamed for the fatal result, but we must accuse the system. The causes of death in these cases were mostly sepsis and uræmia, after a secondary hemorrhage. Cystitis and suppression of urine had preceded. Nowadays the strongest advocates of urethrotomy will not promise a cure, and patients so operated on will remain patients till the end of their lives. Any incision either heals by first intention, which makes the caliber of the same size as before the operation; or if the divided surfaces are kept apart a cicatrix by granulation is the consequence, which is worse than it was before the cutting. Other methods may cure certain strictures which are simply contractions within the urethra, but it has not been proved that fibrous pathological conditions of induration, invading tissues outside the urethra, and even the corpora cavernosa and spongiosum, can be removed by cutting, divulsion, or dilatation.

Electrolysis absorbs the fibrous infiltration by the chemical action of the negative pole. The writer has often demonstrated such decompositions by electrolysis, and it is taught in any text-book on physics and chemistry. In surgery the rule is, weak currents will absorb, strong currents must cauterize and destroy tissue. Hence it follows that for the treatment of urethral strictures by electrolysis we must use a weak current, never more than five milliamperes, and depend principally on the action of a galvanic chemical absorption. Such currents never can burn.

Electrodes and battery must be made correctly and in accordance with our principles, as described in former papers. No force or pressure must be used, no hemorrhage caused, and a case never operated upon during the existence of any acute symptom. No pain or inconvenience must be produced, and the séances must not be oftener than once a week.

Is it Dilatation?—We protest against having the process of electrolysis called a dilatation or a modified dilatation. It is not dilatation in any sense, since this is an entirely different action, in which some kind of force or pressure is always used and is absolutely necessary. Any force in electrolytic applications is a great error.

In electrolysis the electrode passes by simply holding and

guiding it through the stricture. It enlarges the caliber by the absorption, and consequent restitution of the size. This absorption of the fibrous tissues goes on gradually, removing the stricture and enlarging the caliber of the urethra until it is restored to its normal size. The operation must never be done when there is present any inflammation, hemorrhage, or discharge. Under such disadvantages failure must follow. If there are excoriation, electricity will do harm, and such conditions must be cured first by other means.

Diagnosis is most important, and must be made so that there will be no doubt that we have to deal with an organic stricture.

Spasmodic strictures will be made worse by the galvanic current.

Other differentiations are granulations, discharges, diseases of the prostate, lacunæ in the urethra, calculus, carcinoma.

The want of education and the need of greater appreciation of the power of electro-therapeutics is well and concisely described in an editorial in the Charlotte Medical Journal for February, 1898, page 178: "Other failures arise from the lack of patient, correct manipulations, and from the fact that the operator is not an electric expert and genito-urinary surgeon combined."

Many kind words have been said about this method, too many to repeat here, but only one may be permitted to show some causes of failure. Dr. H. H. Hahn, of Youngstown, Ohio, read a paper before Mahoning County Medical Society, in which he says as follows:

"In addition to this, there is such a thing as a special aptness for this kind of work, and when this is associated with the other requirements mentioned the claims we have made will certainly be verified. The venerable and grand Dr. Robert Newman of New York, who has so successfully treated hundreds of cases of stricture of the urethra by electrolysis, has been striving for years to force upon the profession at large just how he accomplishes it, and yet we find men here and there decrying the method as inefficient and dangerous, claiming that they had tried it, and in some instances exposing their abominable ignorance by admitting that they had produced cauterization, and that the treatment was followed by a worse stricture than the one it was attempted to cure. We

simply say that Dr. Newman does not cauterize with his own hand, and when some fool, through his ignorance and clumsy manipulation does so, neither Dr. Newman nor his method is responsible. It is the operator alone, and that too in spite of clear and explicit directions in every detail laid down by Dr. Newman. All we demand in this matter is fairness."

There are numerous advantages of electrolysis in the treatment of urethral strictures which have been set forth in former papers. The principal one, however, is that it cures, and once cured, no relapse is possible. The patient is not kept in bed any time, and loses no time from business or pleasure. All of which has been proven by documentary evidence during thirty years.

Drs. Holliday and Burton report successes and close their excellent, concise paper as follows: "The above statements are not the wild vaporings of an excited imagination, but sober conclusions formed from a long experience, a practical structure reared upon the rock-bed foundation of the eternal, unchangeable laws of physics and chemistry, woven by man's ingenuity into the applied science of electro-therapeutics."

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.  
NEW HAVEN, CONN.

THE therapeutic use of dry heat of high degree has been attracting the attention of the medical profession with increasing force for several years. First proposed as a means of assisting in the cure of rheumatism it has gradually invaded other pathological fields, until it now occupies a place in the highest rank of therapeutical measures. It has been demonstrated to be capable of overcoming enough conditions which were entirely unamenable to treatment before its development to justify belief that it will play a most important part in the therapeutics of the future in every disease characterized by impairment of sympathetic nerve function, tissue degenerations, and inflammatory processes, septic or traumatic. Very few studies and observations of its action from a standpoint of accuracy and science have so far, however, been recorded, and its use to-day is mostly empirical.

The object of this department is to extend the knowledge and develop the use of this agent, radiant heat, ultra-violet rays, etc., so that they may be intelligently prescribed according to their limitations, and the results thereof susceptible of prognostication with as much certainty as is the case with any other remedial measure. "The proof of the pudding is in the eating," hence the most valuable data consists of case reports. To be of value, however, they must be accurate and so constituted that comparison will be possible and reliable.

Contributors to this department are therefore requested to report in detail upon the following points in connection with their cases, viz.: exact diagnosis of disease and condition, when possible; variety of treatment, whether body or local, whether or not wrappings were used and, if they were, how many thicknesses and of what material composed; duration of treatment; degree of temperature attained; immediate and after effects upon the patient; and whether or not other measures were used in conjunction. If they were they should be described in detail.

In conclusion, we will state that reports of cases in which the remedy has failed are of as much importance in forming a judgment of its efficiency as those in which it has succeeded. The only limitation which we care to impose upon contributors is that their reports be full, accurate, and reliable.

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*Hot Air in Surgery.* R. W. Corwin, M. D., Denver Medical Times, June, 1901.

In surgery there is no question regarding the efficacy of dry heat.

For sprains, stiff and tubercular joints, it has proven itself of the greatest value. It is worth the while of any physician or surgeon to give superheated dry air a thorough trial. It is not an experiment; it is safe and has been long tried. While much has been accomplished through its influence, I cannot feel that its limit has been reached or all its secrets revealed.

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*Dry Hot Air.* Orrin S. Wightman, M. D., New York Medical Journal, August 17, 1901.

#### SUMMARY.

1. Dry heat is a valuable pain reliever without any of the depressant effects common to drugs.
2. In connection with constitutional or medicinal treatment we have in it a positive curative agent.

3. It is a stimulant to rapid repair and absorption.
  4. It is one of the most valuable eliminative agents we possess.
  5. Where indicated, it possesses a sedative action on the nervous system obtained by no other means.
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*Inhalation of Dry Hot Air in Chronic Lung Affections.* Dr. J. Byron Sloane of Detroit, Mich., in the Denver Medical Times.

He reports most gratifying results in the treatment of tuberculosis, chronic bronchitis, asthma, and chronic inflammations of the nose and throat by a modification of the inhalation method original with himself. The apparatus consists essentially of a glass mouthpiece, in the distal end of which is placed a sponge saturated with a medicated solution, and so arranged that all the air that the patient breathes must first pass through the sponge. The rest of the apparatus consists of an arrangement whereby the air is heated before it passes through the sponge. Inhalations are given six times daily for thirty minutes, but medicines used are not specified.

The author claims that by thus heating the air to be inhaled the efficiency of the treatment is increased at least fifty per cent., and reports two cases, where the sputum contained large numbers of tubercle bacilli, that were entirely cured, one in six months and the other in two years. Other cases of a like nature and in which a like result was obtained are mentioned, and he has one hundred cases of different diseases now under treatment by this method. He closes the article as follows: "We have in this treatment, viz., the introduction of medicine through the medium of hot air, that which promises to be, judging from the experience I have had with it, a positive cure for this all-distressing disease, and especially the 'white plague' in the first and second stages, and in a great many cases in the more advanced stage."

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D.

The apathy of so many surgeons towards the employment of radiography has resulted from an attempt to employ a new and technical scientific discovery without (a) the necessary knowledge of the means employed; (b) the dangers involved; (c) the limitations of the scope to be covered; (d) lack of acumen necessary to obtain precision which would cause the shadowgraph to approximate existing conditions.

Coils and other apparatus have been unnecessarily sacrificed, a large number of patients have been burned, the impossible has been expected, and a class of work done conspicuous for inaccuracies of localization, relative position, and detail; resulting in much dissatisfaction. Radiography is a science in which no novice can expect to show proficiency. And nothing, barring an occasional accidental success, is more apparent from a display of his radiographs than the operator's experience or care.

Every effort will be made in this department to meet the educational demands in everything pertaining to method. Abstracts and extracts from current literature of a character tending to improve the general technique will be made, and as many leading original articles will be published as space will permit.

With each issue of this journal will appear two skiagraphs of a high order of excellence, and in each instance be accompanied by a statement of the following details of its production:

(1) Brief description of the apparatus, including capacity (length of spark) and manufacture. If a static machine is used, state also number and diameter of revolving plates and approximate speed employed. If a coil is used, give current employed, stating the amperage of the current passing to the tube (approximate).

(2) Description of the tube: (a) manufacturer; (b) distance (if not known approximate) between the anodal plate and cathodal cup; (c) length of spark-gap backed up before radiance appears; (d) the operator's expression as to the quality of vacuum and other points of individuality.

(3) Distance from sensitized plate to anode, and relative position of tube to the object exposed.

(4) Length of exposure in minutes and seconds.

(5) Make and character of plate: (a) giving number of coatings of film; (b) sensitiveness; and (c) age of plate, when known.

(6) Developer used, and time and particulars of development.

(7) Particulars concerning printing, paper, etc.

(8) A description of the characteristics of the subject, giving peculiarities—age, density, and general structure, as to



Old injury to elbow-joint. Fracture of humerus, with backward dislocation of ulna and radius, unreduced after eighteen years.

Taken by L. A. Weigel, M. D., Rochester, N. Y.

Static Machine.—Sixteen 30-inch plates, Van Houten & Ten Broeck.

Tube.—General Electric, adjustable.

Distance between anode and cathode, about three inches.

Backed up two-inch spark (soft tube).

Distance from tube to plate, twenty inches.

Exposure—One minute.

Cramer X-ray plate, developed with pyro-soda.



*Fracture of radius.* Skiagraph made twenty-four hours after injury.  
Made by L. A. Weigel, M. D., Rochester, N. Y.

*Static Machine.*—Sixteen plate 30-inch.

*Tube.*—General Electric, adjustable.

*Distance between anode and cathode,* about three inches.

*Backed up two-inch spark* (soft tube).

*Distance from tube to plate,* eighteen inches.

*Exposure.*—Forty-five seconds.

*Stanley Plate,* developed with pyro-soda.

muscle and fat. (The latter are of so great importance in determining the results of skiagraphs of the body that an excellent result may not otherwise be appreciated.)

The points of merit receiving special recognition will be clearness of (1) detail and definition; (2) pathological or anomalous conditions displayed; (3) character of result in difficult regions, and cases where density of intervening structures makes detail and outline indistinct.

If by this means a standard of excellence is established with comparison of method and results it will repay the effort.

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*X-Ray and Photographic Technique Necessary to Bring out Bone Detail in the Print.*" Eugene R. Corson, M. D., Savannah, Ga., in Annals of Surgery for October.

He considers the reason for the presence of little more than bone outline in skiagraphs to be underexposed plates and lack of proper fixation. Although he, as well as Professor H. v. Ziemmssen and Professor H. Rieder in Die Röntgengraphie in der innern Medicin, believes the electrolytic break by Wendte, which increases the amount of current going through the tube and lessens the time of exposure, of value, he states that it is not needed for skiagraphing bones. He uses "a good fifteen-inch coil, with a large condenser capacity, energized by a large storage battery, with the Queen independent interrupter and the Queen self-regulating tube." He prefers a powerful coil to the static machine. The part must be firmly bound to the plate. Weights may be used on the limb above and below the plate to prevent movement from "arterial pulsation."

In order to prevent inequality of the negative, the back of the plate is flowed with "Hance's ground-glass substance," and the negative is evened up by rubbing burnt umber into the thinner portions, and printed on matt velox." The best plate for copying the positive is a "Carbutt A" plate.

A.-S.

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## ORTHOPEDICS.

FOR the relief of the large class of unfortunates included in this section of our journal, it is a recognized fact that the physical measures—electricity, hot air, hydrotherapy, therapeutic exercise, and the various appliances for support—afford the chief means of relief.

For the treatment of deformities, congenital or acquired, adapted appliances, with electricity and exercise to maintain the nutrition of the parts, meets the requirements of a very

large class. Surgery is required in others, but must always be supplemented by some of the above measures.

The paralyses, from whatever cause, call for two of the measures in all cases when any hope of improvement is entertained—electricity and exercise, to which in many cases, especially in the young, the orthopedic appliances must be added.

It is, however, to the sufferers from inflammatory diseases affecting the joints of the body or the muscular action in the vicinity of the joints that these measures, especially electricity of high potential, prove of inestimable value. It will be made a feature of this department to keep constantly before the readers the progress in this most important branch of orthopedics, and facts are now developed that will prove of constantly increasing interest as they become more generally recognized.

No means is so instructive in showing technique and results as a history of cases and their treatment. As many cases will be published monthly as space will permit, with the name and address of the contributor. Diagnosis should be made clear in each instance, with specific details as to method, time of administration, and dosage, thereby forming a basis which will serve as a guide to others.—Ed.

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*How to Treat Muscular and Joint Sprains of Railway Employees.* Dr. Haldor Snee, St. Paul, Minn., in a Digest of Current American Literature found in *The Journal of Physical Therapeutics* for October 15, 1901.

The injuries included sprains or strains of fingers, wrist joints, shoulder joints, foot and ankle, knee, hip, and thigh, arm, back, and side.

As a summary he states:

1. Ligaments are rarely if ever torn in so-called sprains, and are never stretched.
2. The pathology in the majority of sprains is a rupture of the areolar and connective tissue around the joint, and a concussion of the lining of the joints.
3. Immobilization of muscles is not rest. On the contrary, in all sprains the muscles should have passive exercise the first few hours and days, and active exercise after that. In the majority of cases active exercise should be instituted from the beginning.
4. The plaster cast should not be used at all, even in cases where there is a fracture, unless it be impossible to maintain a proper position of the joint.
5. Hydrotherapy, in the shape of ice applied over a wet

cloth for the first few hours, water in the shape of hot fomentations, or in the shape of the Scottish douche, where stimulation is desired, is of great value.

6. Counter irritation of static electricity in conjunction with massage is the best treatment of a sprain.

7. The ambulatory treatment of sprains in conjunction with massage is to-day the best treatment.

[The above statements confirm a large experience in these cases. The doctor fails, however, to recognize more than a counter-irritant effect from the static applications, which in reality is the effect of least importance.—Ed.]

*The Mechanics of Lateral Curvature as Applied to the Treatment of Severe Cases.* Robert W. Lovett, M. D., Boston. Conclusions in Boston Medical and Surgical Journal.

In cases of scoliosis with fixed bony curves, the same theory of corrective treatment cannot be applied as in cases of scoliosis with flexible curves. The fact that there is a fixed portion of the spine situated between two movable parts makes it easier to twist or displace the thorax as a whole than to make any change in the curved portion itself. As a result of this, forcible attempts to correct bony rotation in fixed curves will increase the lateral curve, unless the thorax is kept from rotating, and forcible attempts to correct the lateral curve are likely to increase the rotation.

To judge from the observations on the cadaver, suspension as a corrective agent has but little corrective effect in rigid cases, being more likely to affect the compensatory curves than to produce any marked improvement in the rigid curve itself.

For the application of forcible jackets, the prone position, with the legs hanging perpendicularly, seems the most effective for two reasons: First, because in the prone position greater side displacement between the vertebra is permitted on manipulation than in the suspended position, because in the former the spine is not put on the stretch and part of its elasticity thereby exhausted; and second, because in the prone position, with the legs hanging perpendicularly, it is possible to apply a jacket which shall flatten, in some degree, the lumbar curve of the spine, and when the erect position is assumed, this flattening of the lumbar spine will necessitate some degree of hyperextension in the dorsal region on account of the equilibrium of the spine.

When the effect of rotations of the spine, in their effect on lateral deviation, is better understood, it will probably be possible to add the element of rotation to the corrective force applied in the treatment of scoliosis.

With regard to forcible correction, one of two things may be done: (1) Force, carefully antagonized, may be applied to the curve itself, with a view to improving the curved portion

of the spine; (2) the curved region may be twisted as a whole, or displaced sideways as a whole in its relation to the rest of the spine, as occurs when unopposed force is applied to the curve. The former is, of course, the more desirable when it is possible, but the latter may be of much use in improving the general outline of the body. The separation of the two is important for the application of intelligent therapeutic measures. It is relatively easy to displace the thorax in relation to the rest of the column, but relatively hard to change the curve itself.

Forcible correction seems to have its place only as preliminary to gymnastic treatment, and the writer would not wish to be understood to advocate the use of corrective plaster jackets except as a temporary means to secure a better foundation for better gymnastic or, if necessary, mechanical treatment.

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## HYDROTHERAPY.

PROBABLY no department of modern medicine has struggled harder for recognition against the prejudice of the general profession than this. At the time when a school of medicine sought to make it the "cure all," an opposition naturally arose, which has died with the school. Great good, however, has resulted, as so often does when extremes meet. The recognized baths and uses of hot and cold water for therapeutic purposes will be given here, with special attention to their practical and economic administration by the general practitioner, as well as the consideration of the technical features of modern equipment called for in the modern sanitarium. The advocates and those familiar with the advanced methods are asked to report cases and furnish other contributions that will call due attention to a therapeutic measure too often neglected.

—Ed.

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*Neurasthenia.—The Use of Hydrotherapy in Neurasthenia and Other Nervous Affections* is a paper read by Wharton Snikles, M. D., before the Philadelphia Med. Soc. (*Therapeutic Gazette*).

In neurasthenia he considers hydrotherapy a valuable adjunct to other remedies, and successful in mild cases independent of other means—more useful in treatment of men than women. The action is to stimulate circulation, aid digestion, and give a general sense of well being.

He advises scientific administration of baths and douches, provided with means of indicating pounds of pressure and de-

grees of temperature. Hydrotherapy, he says, does not agree with all neurasthenics. In excitable, nervous, and apprehensive, as with other procedures, the conditions are often aggravated. In such he advises wet pack and sponging of the spine with hot and cold water at home or in his room until his confidence is gained. Insomnia is often relieved by a full hot bath at bedtime, administered with the head surrounded with a cold wet cloth or ice bag. In most cases of insomnia the wet pack, followed by friction, is of great utility. In others the drip chest does the most good. In all, the rationale is the same—first capillaries contract, accompanied by hyperæmia of brain and internal organs, to be followed by the opposite condition. In melancholia the hot air bath, followed by the Charcot or Scotch douche often gives great benefit. He refers also favorably to the treatment of nervous dyspepsia by the same means.

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*Hydrotherapy in Chronic Diseases.*

A practical article by Simon Baruch of New York appears in a recent number of Boston Medical and Surgical Journal. He says that chronic diseases are proverbially opprobrium medicorum. How few well-established cases are cured by medical means every physician knows too well.

The idea is gradually dawning upon the medical profession that just as in acute disease the application of those agencies which maintain a healthy condition of the organism may be utilized to advantage when the latter is attacked by disease, so may we in chronic maladies obtain better results from the systematic application of the so-called hygienic agencies. The idea which originated with Jacob Bigelow, and was supported by Oliver Wendell Holmes and Hooper of Boston, failed to make a lasting impression after these able men disappeared. But the dawn of a brighter day in therapeutics, due to increased education and knowledge among average medical men, has revealed the wisdom of their earnest teaching. To-day the methodical application of air, rest, exercise, diet, and the internal and external use of water form the chief agencies in the removal of chronic diseases. These agencies are all important; but if I may credit my own observations of many years, and a somewhat extensive familiarity with the observations and writings of the best clinicians of modern times, water is probably the most effective—at any rate the most indispensable.

Phthisis affords the most striking illustration of the hygienic treatment. The management now universally adopted in the best institutions combines the open air, dietetic, and water treatment. Indeed, this is the method devised by Brehmer, the father of modern phthisis treatment. In all the institutions which I have visited in Germany hydrotherapy is daily ad-

ministered, not quite as systematically as is done in the Monte-fiore Home, where I introduced it many years ago, and where it is still successfully applied every day.

I trace the favorable results to the irritant effect of cold water upon the sensory terminals in the skin, which arouses the central nervous system to reflex effect upon the respiration, deepening it; upon the heart, improving the pulse, enhancing glandular action and excretion; upon the stomach, improving appetite, digestion, and hematosis. After cold procedures the hemoglobin has been found increased, as well as the red and white cells, from ten to fifteen. This would show that the enhanced ventricular contraction drives these cells from parts where they have been sluggishly circulating, and in this manner more blood cells are exposed to oxygenation in the air cells. This daily neuro-vascular training so improves the patient's resisting capacity that the disease is held in abeyance and under favorable environment removed.

Neurasthenia is a disease which has proved very amenable to hydriatic treatment. Although mild forms yield to change of environment, exercise, or the rest cure, the addition of hydrotherapy produces a more rapid improvement. In obstinate cases this agent has succeeded when all others have failed. The prevalence of this disease of modern times is well recognized, and I deprecate the use of the popular tonics, nerve stimulants, regular and irregular. I also beg to emphasize the necessity of care in prescribing water, of avoiding surprising or shocking the patient. Home treatment should be begun by allowing the patient to stand in water at  $100^{\circ}$ , covering the ankles, and washing him rapidly with a large piece of gauze dripping with water at  $80^{\circ}$ . This is to be daily reduced  $1^{\circ}$ , until  $60^{\circ}$  is reached. Affusions from a basin containing water at  $80^{\circ}$ , and reduced daily until  $60^{\circ}$  is reached, may follow the first treatment. Then the drip sheet and wet pack may follow. These home procedures, administered by skilled nurses in accordance with the technique described in books on hydrotherapy, will bring relief and often entire recovery in a large proportion of cases. If a skilled nurse cannot be obtained, it is better not to use cold water at all, but send the patient to an institution where ambulant cases are treated. I am gratified to have learned that such an institution now exists in Boston.

Diabetes is a disease which, empirically treated by diet, is often relieved at the expense of great discomfort. By stimulating the myolemma to utilize sugar, exercise may be made an important curative factor. The great lassitude of the average diabetic precludes resort to exercise, but by judicious neuro-vascular training with graduated cold douches the patient's lassitude is overcome, his energy and spirits revived, and he can be induced to walk sufficiently to utilize much of the sugar

that would otherwise be wasted. In illustration of this treatment: A woman weighing 280 pounds, sixty years of age, unable to walk two blocks, and having six per cent. sugar, which the most exacting diet had reduced only one-half per cent. was in four months entirely freed from sugar, and has remained free, with two very brief lapses, even though the diet has been somewhat relaxed. In this case hot air baths to produce perspiration, followed by graduated douches and resisting movements, reduced the patient's flesh and imparted energy and a desire to exercise, to which she had long been a stranger. Cases of nervous dyspepsia are also fruitful for hydrotherapy, after they have run the gamut from hot water and Saulisbury steak to lavage.

Hysteria is a disease which often strikes terror into the hearts of friends and physician. Charcot's immense success with cold douches has been repeated by his successors in Salpetrière, Krafft, Ebing, Erb, Moebius, and others.

Obstinate hemalgias, sciatica, neuritis, lumbago are greatly relieved and often removed by hot applications followed by cold douches.

A case of asthma in my own family, which had resisted the most skillful therapy of able colleagues, yielded to daily affusions at 50°, while the patient sat in water at 100°, followed by friction to excite reaction. In cardiac disease with lost compensation the value of the Nauheim treatment is well known. Here we have a full bath of 86° with the substitution of a chemical irritant for the mechanical (friction).

Angina pectoris is more frequently false than real, and therefore often removable by hydrotherapy.

I trust the future may see a more careful study of the entire subject, greater precision in the therapeutic administration of water, and finally, that it may have consideration in the medical curriculum.

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### THERAPEUTIC EXERCISES.

THE importance of athletics or gymnastics has been recognized since the time of ancient Greece and Rome, but many and varied are the phases through which the subject has passed. At first gymnastics were in the nature of sport alone, but after the recognition of a relation between exercise and health they were evolved in many ways. Some leaders gave their time to joint movements, others harmonized exercise and education, still others developed special systems, and yet others made the subject one of ridicule by being extremists and advocating movements of superficiality.

Each system has its advocates. The foundation of the Ger-

man system is phycho-physiological, having general physical culture as its aim and favoring work with apparatus. Ling, the founder of the Swedish system, regarded a physiological base necessary. In England, Bernard Roth, F. R. C. S., has done excellent work with exercises in the treatment of spinal deformities. In America among noted workers are Dr. Dudley A. Sargent of Cambridge, Mass., Dr. J. W. Seaver of New Haven, Conn., Dr. Savage of New York City, N. Y., Dr. J. H. Kellogg of Battle Creek, Mich., and many others who have and are developing exercise along therapeutic lines. In the past many, as the late Dr. C. Fayette Taylor, have done much for the cause. To such exercises, interesting to the originator from the standpoint of result, to the surgeon and physician from their relation to deformity and disease, either alone or in combination with other means do we apply the name therapeutic exercises. Others, as Delsarte, etc., have developed parts of systems that have some merit, and appeal to some of the general public, especially schoolgirls in their teens, owing to grace of motion, etc., and of late years many have been the so-called systems represented by agents throughout the United States to teach the gullible "physical culture in six weeks." As the term "physical culture" has been so misused, let us leave it to faddists.

Therapeutic exercises have anthropometry as a starting point. History, inspection, palpation, percussion, auscultation, mensuration, stethometry, pneumatometry, spirometry, microscopical examination, and urinary analysis should be considered in making observations. The physician should then advise the case in connection with the party carrying out the essential exercises, for the doctor bears the same relation to the operator as he does to the pharmacist. Therapeutic exercises have their particular adaptation. Sometimes best results are obtained with them alone, and again in connection with medical, surgical, hydrotherapeutic, pneumotherapeutic, or electrical measures, especially with the high-potential apparatus.

To all who use such means are the columns of this journal open, and to such we extend a cordial invitation for the purpose of establishing a closer relationship between physicians and the advocates of therapeutic exercises, who bring one more balm to human ills in the service of those who come "closest to the mystery of life and the mystery of death, who

read the naked heart when it is too weak or too sorrowful to hide its nakedness."

A.-S.

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## DIETETICS.

FOR many years the subject of human foods was neglected except as the medical man treated it empirically. To Liebig, whose pioneer work appeared in 1842, do we owe the first impetus in the scientific study of foods, so important to the welfare of the animal economy. Dietrich, Konig, and, in our own country, Professor Atwater, Professor Jaffa, and others have done much in the interest of the cause, which has within the past few years attracted the more general attention of the profession.

In connection with the scientific research as regards the chemical and percentage composition, and adulterations of food, we must consider anabolic and catabolic processes, environment, habit, and idiosyncrasy, both in health and disease.

"I have come to the conclusion that more than one half the disease which embitters the middle and latter part of life is due to avoidable errors in diet," says Sir Henry Thompson, with whom the general practitioner must agree. Always should we remember the object of food—the growth and maintenance of the body, the fuel supply for warmth or energy, the reserve for use in the future. From food analysis we learn that it is possible with proper selection to live and maintain the body equilibrium upon a wholly animal or wholly vegetable diet, or e'en upon certain artificially prepared foods; but our journal cares not for the passing diets of experimentation, interesting alone from a scientific view, but extends a cordial invitation to all scientific or medical men at home or abroad who from their wealth of knowledge can bring contributions to suffering humanity for the preservation of health, and the prevention, care, or cure of disease.

A.-S.

*The Dietetic Management of Typhoid Fever*, by David Inglis, M. D., of Detroit, Mich. Abstract from the Dietetic and Hygienic Gazette.

The assumption has been that milk, being a liquid, is readily assimilated, leaves but "little or nothing to pass through the bowels," is nutritious, and hence meets the principal indication in typhoid fever.

But the fact of the matter is casein, a solid, passes to the intestines, from whence it passes as curds, and causes trouble if the early diarrhea stops. Another argument against the milk diet is that milk forms a most favorable culture media for bacilli, especially for the typhoid bacillus. The arguments presented for this view of the case are certainly well founded and interesting.

He considers the ideal diet to be pure water in abundance, thereby keeping "the excretion by skin, lungs, kidneys, and liver to their best, and our typhoid patients need to keep all means of elimination of poison in fullest activity, providing it be not a prostrating activity." If you must give food, give any of "the best advertised meat-juice foods (so called), which contain little real food value" and are mostly absorbed in the stomach. When the appetite returns "give such foods as are most completely digested and absorbed in the stomach; keep steadily in mind that while the stomach may be acting but poorly, the intestinal condition is far worse."

With regard to stimulation during convalescence he advocates instead of alcohol a drink of good coffee—"a delicate after-dinner coffee cup full of good coffee with cream and sugar," sugar being highly nutritious, promptly and easily absorbed, and leaving no detritis.

### **CLIMATOLOGY.**

THE adaptation of climate to certain pathological and diathetic conditions is a subject which deserves special consideration.

It will be our purpose to publish with each issue at our own discretion an article of limited scope describing the advantages of various localities, with an illustration showing a well-managed institution. No article will be published for advertising purposes, and can only include localities having some special climatic advantages.—Ed.

### **BOOK REVIEWS.**

**ELECTRICITY IN MEDICINE AND SURGERY.** By William Harvey King, M. D., of New York. With a section on Electro-Physiology by W. Y. Cowl, M. D., of Berlin, Germany, and a Section on the Bottini Operation, by Alfred Freudenberg, M. D., of Berlin, Germany. Price \$3.50. Published by Boericke & Runyon Co., New York.

This work of five hundred pages includes a consideration of the general physics of electricity, a section on the X-ray, chapters upon the technique of all modern methods of admin-

istration, and the body of the work is devoted to special therapeutics.

The writer has succeeded in his undertaking to make his work "reliable in the use of electricity in medicine and surgery," adding to his own labors the work of other able collaborators.

He has also shown a familiarity with the literature of the subject and a fairness in his treatment of the views of others which is commendable. The work, so far as Dr. King's writing is concerned, is distinctly American, as a work so comprehensive at the present time must be.

The field of electro-therapeutics is now so broad that to treat it in so small compass is bound to be at the expense of detail. This fact has been overcome as far as possible by the writer's clear and concise style and by the liberal employment of cuts and drawings. The student will derive from the work the kind of instruction which will constitute a sound and comprehensive groundwork for future growth.

While in the matter of technique and selection of modalities for special administration advances have already been made from positions taken by the writer, the work will be an authority. It is a scientific, conservative, and practical treatise and a safe guide in matters of dosage and technique.

**THE TRANSACTIONS OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.** For the Ninth and Tenth Annual Meetings. A volume of about 400 pages. Price \$2.00. Published by the Davis Co. of Philadelphia.

This attractive volume contains forty-five contributions from leading authorities on the subject both in this country and Europe, and is probably the best index of the professional thought upon the progress of the science published.

To those who care to become familiar with the style of thought and writing of their contemporaries in this department of medicine, as well as to obtain the most advanced ideas, the work is invaluable.

**AN INTERNATIONAL SYSTEM OF ELECTRO-THERAPEUTICS.** For General Practitioners and Specialists. By Numerous Authors. Edited by Horatio R. Bigelow, M. D., Author of "Gynecological Electro-Therapeutics," etc., etc. Second Edition, Revised and brought up to date by G. Betton Massey, M. D., Ex-President and Fellow of the American Electro-Therapeutic Association; author of "Conservative Gynecology and Electro-Therapeutics," etc. Thoroughly Illustrated. Royal octavo. Pages x+1147. Price net, delivered, extra cloth, \$6.00. Philadelphia : F. A. Davis Co., Publishers, 1914-16 Cherry Street.

This work is compiled by some of the world's best authorities upon the subject, and many of the articles are classical in the highest sense, making the work an invaluable reference book for all who would have a complete library in Electro-Therapeutics. The name of the editor of the second edition

is a guarantee, as the work attests, that the task has been conscientiously performed.

The new contributions by Dr. Massey are valuable additions. The chapter on the Roentgen ray is not representative of the present scientific status of the subject. It is also to be regretted that more has not been added on the subject of high potential currents. While the omissions are apparent, they are but parts that go to make up a great subject, the entire compass of which one volume cannot be expected to comprehend. The work is as a whole a valuable contribution to electro-therapeutic literature, and one deserving inspection and careful study.

The Journal of Physical Therapeutics for October, of which Dr. Margaret A. Cleaves is the American editor, shows a marked improvement over preceding numbers. Notable articles appear from L. A. Weigel, M. D., of Rochester, and Henry Ling Taylor, M. D., of New York. The notes from current American literature are excellent, and show a remarkable contrast in the subjects treated over the foreign contributions.

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#### ELEVENTH ANNUAL MEETING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.\*

FIRST DAY—TUESDAY, SEPTEMBER 24.

The meeting was called to order by the President, Dr. Ernest Wende, of Buffalo, at 9.40 a. m., in the 74th Regiment Armory.

The Secretary read the minutes of the meeting of the Executive Council held on September 23.

On motion of Dr. Robert Newman the report of the Executive Council was deferred until the next day.

The address of welcome was delivered by his Honor, Dr. Conrad Diehl, Mayor of Buffalo. He said:

Mr. President: It again becomes my pleasant duty to welcome you to our city. I hardly know what to say different, except to hear from you the difference in my remarks made to you three years ago. As you remember, I said at that time that I had noted the advances made in the past thirty-five years in electricity. The presentation here of the various papers must be a benefit to you, and through you to mankind, especially to the general practitioner, like myself, who has not the time to devote to a special study of this very wide field of electricity. I look forward with pleasure to reading in your Transactions the advances made in your science in the past two years.

\* Held in Buffalo, N. Y., September 24, 25, and 26, 1901. Ernest Wende, M. D., of Buffalo, President.

I hope, gentlemen, you will find in the intervals of your sessions opportunity to visit our great exposition. I am sure you will find much there which will interest you and help you along in your work. I mean by that not merely the electrical appliances, which may not be new to you, but the evidences of the advances in other departments of science, and in civilization in general. By studying these things you are certainly better fitted for pursuing your own special studies. Your local committee will take pleasure in showing you the beauties of our city, which we consider second to none. I hope your visit to us may be a pleasant one, and that you will carry back to your respective homes pleasant remembrances of our city, and will always look back with pleasure to your visit here.

Dr. Robert Newman of New York responded as follows:

Mr. President, Ladies, and Gentlemen: To respond to the address of welcome is an honor to which I am chosen, but I do not feel competent for the task assigned me, and would beg your kind indulgence. I have made only one address in a long period of years, while our host, his Honor, the Mayor, has been admired daily for his eloquence before the different societies meeting in this city.

Mr. Mayor: On behalf of the American Electro-Therapeutic Association I tender sincere thanks for your graceful address of welcome, which stimulates our members by the assurance of the protection of the authority of this great municipality. We have been in the habit of electrifying at our meetings, but here we give up any such intentions, for we know we shall be electrified and illuminated—of course, by electricity.

It has been my good fortune to have been in Buffalo on flying visits for a number of years. I cannot, to be sure, say that I was here as far back as the time when the buffaloes ran wild in the streets, but at every visit I have seen many Buffalonians executing graceful movements in the streets. Here I have met patients, friends, co-workers, old acquaintances from the war and revolution of 1849 in Germany. Here I have admired the faculty of the Medical College, which has at all times been second to none in America. The faculty was founded in 1847 by my dear late friend and former professor, Austin Flint, in conjunction with Frank H. Hamilton, then the authority on fractures and dislocations. There was also the genial Professor J. T. White, but all are dead and gone now. Austin Flint was the true physician, an original goodness, whose place in the profession never can be filled. After being in New Orleans and Boston he resumed his professorship in Buffalo in 1856, and in 1858 his son, who had studied in Paris, became here the professor of physiology.

Now, let us take a glance at the faculty in 1878, a memorable year, and one which even our president will recollect and look back to with pride. There we had our Dr. James T.

White, a beloved professor, a good citizen interested in municipal affairs, and a successful practitioner; we had the genial Professor Thomas F. Rochester, the learned E. V. Stoddard, whose place after his demise was filled by Dr. Cronyn. Again, there was the successful surgeon, Julius F. Minor, along with others of eminence. The professor of surgery could never be forgotten; his lectures were clear and easily comprehended by his hearers, and without any exception Dr. E. M. Moore, of Rochester, was the best teacher of surgery. Changes in the faculty have taken place, but even at this date it is still in the front van and continues to make its mark.

Let us go back to the year 1878, when Buffalo entertained the American Medical Association on a scale of grandeur which surpassed all previous meetings, and can never be excelled. I never can forget it, and it is imbedded in the garden of my recollection. Of this I have proof, for here in the depths of my pocket is the invitation of Mr. and Mrs. Bronson C. Rumsey. The great reception was unique, and was conducted with dignity and grandeur. No royalty, no European court, could have done better, or even as well. Nothing was overlooked for the amusement and pleasure of the guests. One great feature was, that after the formal introduction we were given into the hands of young ladies, real Buffalonian beauties, ladies of honor. Don't imagine that these ladies took the doctors on their hands as equilibrists, but they took charge of them and guided them from the palatial residence through the garden, park, hot houses, on the lake in a Venetian gondola. Two orchestras, and fireworks in the evening, served to enliven the scene, and a bountiful supper was served in the several parlors. Other receptions followed in the late hours of the evening, one by invitation of Dr. James T. White, and they were all enjoyable.

The next day we were entertained by a grand excursion to Niagara Falls, and we had free entrance to all places. Just here let me tell you a secret. The liberality of the committee was inexhaustible, and in their generosity they even offered us the Niagara Falls. If we had accepted, only think you would have now no power from the Falls and no Pan-American Exposition. We were timid, and with an unusual modesty declined this generous offer, and left you the Falls just where we expect to find them on Thursday.

This association met here in Buffalo three years ago, and were welcomed by you, Mr. Mayor, very cordially and told we must come again. We were made at home, and particularly entertained in an original and novel way by the indefatigable chairman of the committee on arrangements, our President of to-day. The pleasures were many, and they were enjoyed by all the participants to such a degree that here we are again for a new, corrected, and enlarged edition.

Now, your Honor, this association appreciates your kind and gracious welcome, and we are ready to follow you and the committee everywhere for sight-seeing. In anticipation of the great pleasure in store we tender our sincere thanks. Let me accordingly quote, as Marquis Posa said, from the German classics of Schiller:

"Arm in arm mit Dir, forder ich mein Jahrhundert in die Schranken."

**THE EXECUTIVE COUNCIL.**

Dr. William J. Morton of New York then presented the name of Professor Samuel Sheldon, of the Polytechnic Institute, Brooklyn, N. Y., and moved that it be added to the list of honorary members. Seconded and carried.

Under the head of communications the secretary read one asking the association to indorse the movement for the establishment in Washington, D. C., of a psycho-physical laboratory.

Dr. Robert Reyburn of Washington, D. C., said that Dr. McDonald had been making for some years past a special study of abnormal man, and the idea was to found an institution to facilitate this research.

Dr. Reyburn then moved that this effort to establish such an institution be indorsed by this association. Seconded by Dr. G. Betton Massey, and carried unanimously.

Invitations to meet at various places next year were referred to the Executive Council.

Dr. W. J. Morton read a communication from the nephew of the late Apostoli, thanking the association for the resolutions of sympathy passed by it last year. On motion of Dr. Massey this communication was received and ordered spread upon the minutes.

On motion of Dr. Newman, seconded by Dr. Morton, the visitors present were made members by invitation.

Dr. W. B. Snow of New York gave notice of a proposed amendment making the dues for the first year permanently what they had been the present year.

A formal motion was then made by Dr. W. H. White of Boston, and was seconded by Dr. W. B. Snow, to change the words in by-law No. 57 from "an initiation fee of ten dollars" to "an entrance fee of five dollars." According to this, it would then read as above, and "which shall include his dues for the first year."

Dr. William James Morton, Chairman of the Committee on Static Machines and Condensers, said that nothing novel or of special interest had been brought to the attention of his committee during the past year.

Dr. Charles R. Dickson of Toronto said that the Committee on Electrodes had no formal report to present, but it was ex-

pected that the individual members would present certain things of interest. The lateness of the publication of the Transactions of last year had prevented carrying out his plan to secure the co-operation of the manufacturers in establishing uniformity of construction.

Dr. W. H. White of Boston described a new cautery transformer which he had used with great satisfaction.

Dr. H. R. Hopkins of Buffalo presented the report of the Committee on Arrangements. He said that the committee had been considerably embarrassed by events which had been entirely beyond their control. The committee hoped to present to the members excursion tickets to Niagara Falls and complimentary admission to the Pan-American Exposition. In these two directions the committee expected to be able to please the Association, and at the same time not run counter to the sentiment prevailing throughout the country at this time. For the ladies they hoped to provide a tally-ho ride to-morrow morning and the next morning. The committee asked the indulgence of the association because of the present state of the country, which had made certain entertainments impossible, or at least, improper.

On motion of Dr. C. R. Dickson, the visiting members of the medical profession as well as electrical experts were accorded the privileges of the floor.

Dr. W. H. White of Boston read a paper entitled "Rectal Stricture Treated by Electrolysis." It was discussed by Drs. G. Betton Massey of Philadelphia, Frederick H. Morse of Melrose, Mass.; Robert Newman of New York; and William James Morton of New York, and the discussion was closed by Dr. White.

Dr. Francis B. Bishop of Washington, D. C., read a paper entitled "Neurasthenic Paralysis," which was discussed by Drs. Massey, Robert Reyburn of Washington, D. C., W. B. Snow of New York, and W. J. Morton, and the discussion was closed by Dr. Bishop.

Dr. M. F. Wheatland of Newport presented a paper on "The Value of Electricity in the Gynecological Work of the General Practitioner." It was discussed by Drs. Massey, Philadelphia; F. B. Bishop, Washington; O. S. Phelps of Battle Creek, Mich.; Dr. Robert Reyburn of Washington; R. J. Nunn of Savannah, Ga., and the discussion was closed by Dr. Wheatland.

On motion, adjourned at 12.50 p. m.

**PROBLEMS IN PHYSICAL THERAPEUTICS.**

The editor will see that inquiries of general interest are answered in this department. Others will be answered by letters. We direct attention to the following rules.

- I. Each inquiry must be accompanied by the name of the writer.
- II. The question must be pertinent to the subjects treated in this journal.

Dr. George S. Burt of Owen Sound, Canada, writes to ask what he can do with electricity for a patient suffering from affections of the labyrinth. He wishes to know exact location at which to place the poles, technique, including choice of current and strength.

Can anyone volunteer the information sought?

*The Negative or Positive Pole in Cataphoresis of Iodine.*

There are on record in the literature statements recommending the use of the negative poles for cataphoreic administration of iodine and potass. iodid. A writer who thinks that he has demonstrated that, as in all other similar administrations, the positive alone is effective, would like an expression from such as can assist in having the matter set right.

**NEW AND IMPROVED APPARATUS.**

This department is devoted to publishing, with illustrations, drawings, and descriptions, new apparatus, electrodes, etc., for the benefit of those interested in the progressive improvements in armamentaria.

*New Milliamperemeter for Direct Current.*

The instrument described is constructed on the principle of the "Deprez-d'Arsonval" type, which comprises a current-carrying coil mounted in jewel bearings, free to move between soft iron cores attached to the pole pieces of a permanent magnet.

In this instrument we embody extreme sensibility, operated by a minimum amount of current.

The scale is uniformly divided from 0 to maximum reading, and the working is aperiodic or dead-beat.

The permanent magnets are of selected material, carefully worked through the various processes, and thoroughly aged before the instrument is calibrated.

The scale is divided into one hundred divisions of 1 millampere each, and capable of being subdivided visually to 1-2 millampere.

A mirror is placed behind the indicator, to avoid errors of parallax.

The scales are hand work, by direct comparisons with standards, and the calibration rechecked after the scale has been inked in.

All instruments are direct reading and may be in circuit continuously without danger on account of heating.

All resistances are made of wire, having practically a zero temperature coefficient, and the windings are non-inductive, preventing the disturbing of magnetic fields.

Great care is exercised in the manufacture of these instru-



ments, which, when properly handled, may be depended upon as absolute standards of comparison.

The instrument is not affected by surrounding magnetic influences, and must not be compared with cheap so-called milliamperemeters.

The parts are inclosed in a neat black enameled case, and all mounted upon a quartered cut oak base, at an angle of forty-five degrees for convenience of reading in a sitting or standing position, presenting a beautiful appearance.

Manufactured by Jerome Kidder Co., New York, and sold for \$25.00.

*The Journal of*  
**Advanced Therapeutics**

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**HYSSTERO-NEURASTHENIC PARALYSIS.**

**FRANCIS H. BISHOP, M. D., WASHINGTON, D. C.**

**Ex-President of the American Electro-Therapeutic Association.**

At the last meeting of this association it was my pleasure to read before this body a paper on "The Causes of Some Cases of Neurasthenia." In this paper the strong, robust subject was principally considered. To-day it is my purpose to present that class of cases so familiar to us all: the highly strung, nervous individuals who seem to live up to their full quota of nervous energy, and who actually accomplish more, mentally, and often physically, notwithstanding their weak and delicate physical strength, than the phlegmatic individual with all his power of frame and muscle. These patients are hard workers; their perceptions are keen and their brain active. They are usually poor sleepers, and do not recuperate fully from the effects of one day's work, before they are plunged into the excitement and worry of the next. This condition goes on from week to week and from month to month, until the usual collapse overtakes them and completely prostrates them. This collapse is often precipitated by some overpowering nervous shock or physical exertion beyond their power of endurance, or some exhaustive, acute disease which leaves them prostrated in body and mind; their power of recuperation seems to have been completely exhausted, and they frequently grow weaker and thinner until they are compelled to take to their beds, and there they gradually lose the use of their limbs in consequence of the exhausted condition of the large motor center in the anterior columns of the cord. Some wasting of the muscles of the extremities will take place, bedsores may supervene, paralysis of the bowels and bladder may occur; and we are justified in believing that death has often claimed its victim without the true condition having been recog-

nized as paralysis due to exhaustion of motor and sensory centers of the cord, or, as might be more technically expressed, a paralysis due to spinal neurasthenia. In the beginning of the nervous breakdown, and during its whole course, it is a very common occurrence for hysterical symptoms to make their appearance in the form of weeping spells, and spells of anger in those who previously possessed the most even and amiable disposition; despondency, with loss of interest in life; in fact, any form of nervous symptom is liable to appear in these cases, for, while the muscular weakness in the extremities, and finally total paralysis in the form of a paraplegia, indicates the involvement of the spinal motor centers, the cerebral centers are also weakened, and various forms of obsessions are liable to form a prominent part in the symptomatology.

The following case came under my care through the courtesy of her family physician, Dr. Ralph Walsh of Washington, D. C., on the 31st of May, 1900. I saw her within a few days after her arrival from Rome, Italy, where she had been bedridden and helpless for six months. At my request the patient wrote out a short history of her case, which will be presented in her own words.

Her illness dated back four years previous to my knowledge of the case, and she writes that it began "in 1896, with a severe attack of nervous prostration,—prostrated for three months, accompanied by sinking spells lasting from three to five hours,—some head trouble (at times slightly delirious, no appetite), insomnia, never became entirely well. In 1898 went under Dr. Weir Mitchell's care and remained under his care for a year and a half for rest cure; had attacks of hysteria, being unconscious for hours at a time, brought on by any slight excitement or anger, extremely melancholy and possessed with the idea of becoming insane; very irritable, suspicious, constantly in an unhappy frame of mind; capable of great physical endurance; much troubled with insomnia; was ordered to Europe away from friends and family; melancholy increased, and physical endurance undiminished; appetite varying, continued in this state nearly a year; gradual loss of appetite, but really remarkable nervous energy and endurance; then for about six weeks seemed to live on air, as I could not retain food; then utter collapse. Various nervous symptoms, spasms of throat, sciatica in severe form, great weakness of

heart, and pain; also intense suffering with head, could not walk but could use hands. Spitting of blood, high fever, delirious at times, also sinking spells. Was in this condition for four months with continued attack of spasms in throat; then gradually lost control of whole body, the left side being entirely helpless; utter indifference to getting well—did not wish to recover. Two months of this helpless condition and I was brought home to die, as doctors did not think it possible for me to survive the sea voyage. The entire limb from foot to hips was in wire splints, as the slightest jar was agony; kept under the influence of morphine and strong bromide; helpless condition continued, lived on stimulants."

The line of demarcation between neurasthenia in the highly emotional subject on the one hand, and hysteria on the other, is not one very easy at all times to draw, and hysterical symptoms are liable to be very prominent in all forms of nervous troubles, whether it be a very serious neurasthenia, or a cerebral tumor, or locomotor ataxia. This case was no exception in that particular, and we find the hysterical symptoms developed after the second year of her prostration, and they became quite prominent as the case advanced: for example, spasms of the throat, and unconscious conditions brought on by excitement and fits of anger. On the other hand, the fits of excitement and anger were undoubtedly easily produced by the exhausted condition of her intellectual cerebral centers, and a very pronounced symptom of severe nervous exhaustion, especially cerebral, was her attack of melancholia, with the ever-present obsessions, in many cases of neurasthenia, of becoming insane, and finally utter loss of interest in life and loss of desire to get well.

When I saw her she was entirely helpless on both sides below the waist, the feet were extended and drawn toward each other, the extensor tendons were drawn tightly over the tarsal bones, and the skin over this region was extremely thin and blue. The knee joints were very stiff, and to attempt to lift the limb or bend the leg caused the greatest suffering in the lower spine and hip; some muscular wasting, but not enough to indicate a lesion of the motor nerves or of the anterior cornua; sensation nearly normal, showing no involvement of posterior columns.

Owing to stiffened condition of knee joints, and the thor-

oughly relaxed condition of ankle joints, the deep reflexes were not obtainable. Superficial reflexes not very well marked, the bowels could not move without enemas, and there was a large and ugly bedsores over the sacral spine. While this patient was formerly, and has been since her recovery, a bright and very intelligent individual, her mind was, during her illness, in a very torpid condition. There did not for a long time seem to exist that perfect flow of mental energy from the volitional centers of the brain to the motor and sensory centers, and she would often act or speak without realizing at the time what she was doing, and, after a few minutes, all would become plain. In other words her acts were mechanical, apparently without her previous willingness or desire to do a certain thing, and she seemed only to realize the act or word afterwards. Her face and body were full of bromide eruptions, and her arms full of punctures from the repeated use of the hypodermic syringe. She had taken but little nourishment or liquid, and, as her heart's actions were constantly very feeble, she had been fed on strong coffee and brandy.

Dr. Walsh met her in New York and brought her home. He immediately recognized the necessity of special treatment, and kindly called me to treat her. I took charge of the case on May 31, 1900, and I wish here to acknowledge my indebtedness to Dr. Walsh for his superior judgment and professional counsel, and for sustaining me throughout the most trying, but successful, period of the treatment. From the very nature of this case electricity became the sheet anchor in the treatment. In the case above reported, as well as in other cases treated by the writer, it has been the only treatment employed except good nourishing food and an abundance of water. The patient here referred to was placed upon a water bed to relieve the pressure points, and the bedsores were treated by sparks from the long wire coil. Under this treatment the sores readily healed. A large pad, attached to the positive pole of a galvanic battery, was placed over the dorso-lumbar region of the spine, and a bifurcated cord attached to the negative side of the battery; at the extremity of these were two small electrodes about two inches in diameter, with these placed over the superior, then the middle, and lastly the inferior cervical ganglion on both sides. A current of about five ma. was allowed to flow for three minutes in each position; then a large hand electrode was

placed over the region of the stomach and ten ma. passed through the solar plexus for five minutes. The same electrode was then placed over the sciatic nerve at its exit from the pelvis, and twenty ma. allowed to pass for five minutes; then, with the coarse wire coil, the paralyzed extensor muscles of the thigh and leg were each in turn made to contract gently for about five minutes more. This treatment was given daily, and under its influence the brain soon began to clear up, the digestion improved, the kidneys acted freely, the action of the heart soon became normal, the sciatic pain gradually subsided, the bromide acne disappeared, and in a very short time the patient really wanted to take more food than we thought altogether good for her. In addition to the electrical treatment pillows, made small and thick for the purpose, were placed under the knees, and the weight of the foot would gradually bring the heel to the bed; other and thicker ones would be substituted until the knees would bend easily. The neck was also very stiff, and the patient could not raise the head from the pillow, and was compelled to lie with the head quite low, as she was inclined to faint away when head was raised. As the heart's action improved, the head and the shoulders were propped up a little each day, at first for only two or three minutes at a time, and then with a gain of only about half an inch each day. After she had been under treatment about two months, we had succeeded in getting her head about three or four inches higher than she had been able to keep it, and on one occasion the nurse allowed her to remain elevated a little too long, which produced severe spasms of the muscles of the back of the neck, that caused her head to jerk for two or three days. After about four months' treatment, she began to move the great toe on the right foot; a week later, the great toe of the left foot. After this she rapidly improved, and in about five and a half months from the time she began treatment by electricity, she attended an afternoon performance at the theater in her rolling chair. She then readily improved; first walking with crutches, then with a cane, and finally without support. She is now, to all appearances, perfectly well, and very grateful to electricity for the return of the life that she and her friends had been led to believe was rapidly ebbing away.

There is an old rhyme, Mr. President, that runs something like this:

" Hot or cold,  
Wet or dry,  
There's nothing so good  
As the oil of rye."

Whether this be true or not, I think we can justly claim that in all forms of neurasthenia, and many cases of hysteria, whether in the strong and vigorous subject, or in the weak and physically as well as nervously exhausted patients, electricity, when judiciously administered to the necessities of each case, will cure more surely, more quickly, and more pleasantly than any other therapeutic agent known to the profession.

### DISCUSSION.

Dr. G. Betton Massey of Philadelphia said that no one present could fail to be intensely interested, not only in this case itself, but in the manner in which it had been presented. A significant fact in the paper was that a cure had not been effected by the rest cure. The failure in this instance might have been a mere accident, yet much depended upon the individual skill employed. The benefit resulting from the use of faradic and static electricity was a lesson in itself. The case seemed to him rather one of hysteria than of neurasthenia. We should not be blind to the fact that hysteria may be associated with the most definite physical organic changes in the body. He had had a case of hysteria in which the arm had been so thoroughly paralyzed, and the nutrition of the skin at such a low ebb, that the skin had cracked on bending the elbow. This patient had recovered promptly under the use of static electricity.

Dr. Robert Reyburn of Washington, D. C., expressed his thanks to the author for his paper. As to the line of demarcation between neurasthenia and hysteria, he would say that it was often hard to draw the line. The failures which frequently occur in the hands of the general practitioners might very justly be ascribed to the slavish dependence upon drugs. The case reported had presented a bromide acne and many punctures from a hypodermic syringe. Many physicians of high repute treat their patients carelessly and in a routine way. A ready and promiscuous use of morphine was to be greatly deprecated, and the resort to it and other narcotics in the class of cases under discussion seemed to him almost a crime. In his own practice he did not use morphine once where he had used it fifty times in the earlier years of his career. Elec-

tricity accomplished a great deal in these cases, largely often by affording an efficient substitute for drugs.

Dr. W. B. Snow of New York referred to the question of differential diagnosis. Neurologists generally agree that hysteria is a common symptom of neurasthenia, however, on the other hand, all neurasthenic patients were not subject to hysteria. The border line between neurasthenia and a state beyond—melancholia and the earlier forms of insanity—was sometimes not well defined. In the case described in the paper it was clearly shown that the patient had delusions, and marked indications of melancholia. The treatment of such cases should not be rest or the use of drugs, but general attention to hygiene and environment, together with electricity, which might be administered in various ways. The method employed by Dr. Bishop was not the one which he used himself ordinarily, and yet success had been achieved. His own method was by static electricity, employing the various electrostatic currents and other modalities. He had yet to see a case of the kind described which would not completely surrender to that treatment. In the earlier stages of melancholia, when there was no organic change, the treatment by electricity was so successful that it was of the utmost importance to convince the neurologists and alienists of the importance of the more general adoption of electricity in this class of cases. The reason for such results was not difficult to understand when the alterative and tonic effects are appreciated. As the president had said in his address, electricity should not be, and was not, a mysterious science. The condition of these patients was always one of malnutrition, and this state was most effectively combated by the proper use of electricity. This result was accomplished largely by the restoration of normal activity. Contractions and painful neuroses, when treated early, were universally relieved by static electricity, and Dr. Bishop has shown that they were also amenable to the constant current—a point of great practical importance because of the ease with which the latter could be applied to bedridden persons.

Dr. W. J. Morton said that he would have risen earlier to discuss this charming paper, had he not thought that electrotherapy rather than neurology should be discussed before this body. He did not think there was any question about making a diagnosis of hysteria, as it was a disease so long known and so well described that one could hardly fail to recognize it. While listening to the reading of the paper he had been puzzling his mind to make a diagnosis, and he had excluded any organic trouble. As between hysteria and neurasthenia, he had no difficulty in his own mind in putting the case down as one of hysteria. Neurasthenia was a waste-paper basket or catch-all for many cases which could not be readily diagnosed. The symptomatology which Beard had built upon was all that

one had on which to make a diagnosis. In the case reported he thought the bedsore was the result of pressure and not of spinal disease, and in this view he believed the author of the paper fully concurred. In considering the treatment he felt that the homely rhyme quoted by the author conveyed a useful lesson, which, in the homely language of Down East, meant that it did not pay to be "too sot" in the use of electricity. We should all strive to know how to use each form of electricity in all cases, rather than to use one form in all cases to the exclusion of others. We should be very catholic in the use of electricity, for, after all, it was the same thing only, like a countenance, it could make different faces. All the different forms of electricity, when properly used, tend to restore the normal activities of the cells of the body. If he had to treat such a case at the patient's house, he would be possibly compelled, as Dr. Bishop had been, to resort to galvanic electricity.

Dr. F. B. Bishop, in closing, thanked the members for the interesting discussion. The diagnosis in the case might easily present different phases of opinion; and, in any event, the patient recovered. He had never seen a true case of hysteria without some form of nervous exhaustion—in other words, neurasthenia, and he had never seen neurasthenia that had not exhibited some of the symptoms of hysteria. It would have been practically impossible to employ static electricity in this case, particularly as it was treated during the summer and at the patient's home. It was an established fact that the negative pole, when applied over the pneumogastric nerve, tends to stimulate the heart; strengthening its beats and lessening the number. The heart is thus given a chance to rest between the beats and accumulate force. Again, the brain was stimulated through the action of the sympathetic. Nor was the action of the galvanic current on the solar plexus to be overlooked or despised. With the faradic current, one picks out the weak and paralyzed muscles. The whole treatment in the case was carried out methodically. When the patient had been able to come to his office he had employed static electricity, because it was easier.



A CASE OF ROUND-CELLED SARCOMA SUCCESS-  
FULLY TREATED BY X-RAY EXPOSURES.

BY FRANK ALONZO KIRBY, M. D., NEW HAVEN, CONN.

In presenting this case to the medical profession, already surfeited with methods of curing hitherto incurable diseases, I anticipate your incredulity. Until very recently, I may safely say, the most eminent surgeons in this country and abroad have been unanimous in declaring that the only feasible treatment of malignant growths is radical extirpation, and that cases inoperable—owing to vital location or too extensive progression—are doomed to an early death, without hope, and oftentimes without an attempt on the part of the attending physician to secure a condition of euthanasia.

I recall vividly the horror I invariably felt during my hospital days upon entering the ward assigned to inoperable cancer cases.

It is such a case I wish to present to you. A patient with an enormous round-celled sarcoma of the neck, pronounced inoperable by three of the most eminent surgeons in Connecticut; a patient suffering the torments of the damned, unable by reason of an idiosyncrasy to take opiates in any form; wishing every day to die, and supported only by the strongest natural fortitude and tenacity; a patient whom the most sanguine would give but a short and painful lease on life; and now within the incredibly short space of six weeks apparently cured; the tumor having disappeared; surface healed; patient free from pain and able to resume work. The transformation is almost miraculous.

Pardon me if I am too enthusiastic or too precipitate in reporting a malignant tumor cured, after but a few weeks' treatment. The facts and conditions, as shown by the accompanying photographs, warrant it.

The complete history of the case is as follows:

Mr. M., sixty-four years old, married, born in Connecticut, a carriage-maker by trade, presented the following interesting family history: Father died at twenty-eight of typhus fever. Mother died at eighty-three of cancer of the stomach. One brother was killed in the army, age twenty-two. Father's father died at age of seventy-six from injury, the result of ac-

cident. Father's mother died at ninety-three of old age. Father's father had five brothers and one sister, one brother living to be one hundred and one years, and all living until past middle life, with no history of malignant disease. Thus, on the father's side there is nothing pointing towards a malignant taint.

On the mother's side, however, the taint is evident. It has already been observed that the patient's mother died from cancer of the stomach at an advanced age. Patient's mother had three sisters and two brothers. Of the sisters, one died at twenty-four of dysentery and two are still living; one, at the age of eighty-four, is healthy; the other, aged eighty-one, has a suspicious swelling in one breast and also a chronic leg sore. Of the two brothers one died at sixty, of carbuncle of cheek; the other, at seventy-six, from overwork. One of the mother's uncles died of carbuncle of neck, and a nephew died of carbuncle of side. We thus trace on the mother's side a malignant predisposition.

The previous history of our patient is as follows: Not considered a strong, robust child. At the age of twenty he suffered for three months from inflammatory rheumatism of neck and shoulders. At about thirty-five he had malaria and asthma, which troubled him more or less for seven years. Patient never contracted syphilis. After about forty-five, patient's health good up to time of beginning of the present condition.

The history leading to present condition, as related by the patient, is as follows:

Three years ago February next, a wagon-pole fell and hit him on the neck, leaving a contusion which lasted about one week.

About two months later swelling appeared about the size of a pea—movable and not painful. Patient formed the habit of frequently feeling this with fingers and moving it about. Swelling kept growing until about the size of a walnut, when it was noticed there was less mobility. Sixteen months from time of first appearance swelling was about the size of a small hen's egg, with fixation more marked. Up to this time tumor caused no pain, and patient felt well.

About this time, in holding a horse from falling over a bridge, patient was severely wrenched, especially through neck

and shoulders. Almost immediately after this tumor began growing more rapidly and became painful, continued growing rapidly, and twenty months from first appearance, or four months after accident with horse, patient consulted a physician, who in turn sent him to a surgeon. He was now advised to wait a few months for cooler weather before proceeding further. During these few months tumor increased in size with great rapidity. It was at this time patient came under my observation, and was immediately seen by two eminent surgeons who pronounced the case malignant, but inoperable. Tumor at this time about the size of a large goose egg, firmly fixed with indurated borders; surface dark and tense, soon breaking down and discharging a sero-purulent substance; manifestly inoperable.

Tumor now seemed to grow more rapidly than ever and extended its borders in all directions; discharge at times considerable and seemed to furnish some relief of pain, patient keeping about. At times I would apply leeches to lessen the pain, and several times excised portions of tumor, free bleeding also giving relief. Other treatment consisted of antiseptic dressings with local analgesics to control pain. This continued for several months and the tumor continually grew larger and more threatening. The patient was now influenced by some misguided friends to enter a quack cancer cure hospital in the northern part of our State, where he was treated for two months by starvation, but the tumor continued growing, and upon returning home I again continued the same palliative treatment. In spite of cocaine, lead, and opium, carbolic acid, and other local analgesics, patient suffered indescribable pain, could not sleep nights, and was in a deplorable condition. It was at this time that I consulted Dr. C. E. Skinner of New Haven concerning the advisability of using the X-rays. We were both agreed that they offered the only ray of hope known to science.

Accordingly, on November 20, 1901, the treatment was begun by Dr. Skinner.

Just before treatments were begun a section of tumor was excised and examined microscopically by Dr. Archibald McNeil, microscopist to the New Haven Board of Health. Cultures were also made from the sero-purulent discharge. The microscopic examination disclosed a typical round-celled sar-

coma, thus confirming the diagnosis. The cultures showed freedom from staphylococci and streptococci, but disclosed the presence of a bacillus closely resembling anthrax, but not identical with it, as was later determined.

The measurements of the tumor, obtained just before treatments were begun, were as follows: Through upper border of ear, seven inches laterally; through base of ear, ten inches; vertically, just back of ear, five inches. The area of ulceration or breaking down was, laterally, five inches by, vertically, three and one-half inches.

I regret to state that the first of the accompanying photographs was not taken until after the seventh exposure when considerable improvement had taken place; and yet none will gainsay the formidable appearance, even at this time.

The tube used was a Truax and Green Improved, and has two anodes.

It forced back a spark-gap of four inches. Distance of anode from patient's skin ten inches. Length of treatments from fifteen to twenty minutes each.

Rays focused alternately during successive treatments upon anterior and posterior portions of the ulcer, but so arranged that the whole ulcer was rayed at each exposure. Because of the size of the sore no screen was used.

There were no evidences of X-ray dermatitis at any time, and no effect upon the hair roots. The tube was excited by a Van Houten and TenBroeck twelve, thirty-two inch plate, static machine.

**Details of Progress.**—As long as there was any excoriation it was noticed that, after each treatment, the surface of the affected area became glazed and dry, and lost to a considerable extent the appearance of angry congestion. As previously stated, the first treatment was administered November 20.

November 24.—Patient reports less pain since first treatment, and the ulcer looks slightly improved in spots.

November 27.—Patient reports much less pain, and ulcer has a decidedly healthier look.

November 29.—Pain still decreasing and appearance of sore still improving. Indurations about the edges of tumor somewhat softened in places.

December 1.—Patient can now move his head and jaws con-

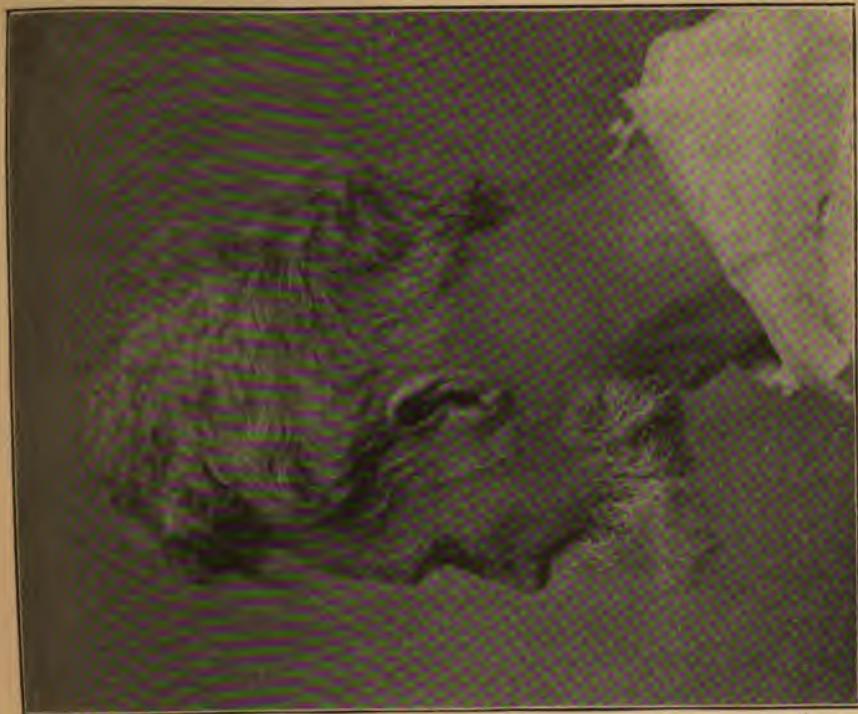


FIG. 2.



FIG. 1.

siderably, which had previously been almost absolutely fixed, is sleeping and eating well, and has little pain at any time. The lessening of the induration is now marked, and the sore has assumed a healthy look throughout.

December 3.—Patient is entirely comfortable, sore rapidly contracting, and induration around edges is decreased a good fifty per cent.

December 5.—No pain of any kind, excepting an occasional stab following the distributions of the major occipital nerve. Induration and swelling rapidly disappearing and healthy granulations rapidly filling up ulcerated spots, and little islets and peninsulas of healthy skin are appearing all over the excoriated area.

December 7.—Occipitalgia has disappeared and sore has decreased in area at least thirty per cent. First photograph taken this morning.

December 10.—The whole surface of ulcer covered with a healthy skin, excepting portion under angle of jaw as shown in the photograph.

December 15.—Still improving; sore still contracting, induration almost entirely disappeared, and granulations rapidly filling up bottom of ulceration under jaw.

December 20.—Ulcer about the size of a five-cent piece.

December 24.—Healthy scab covers completely what is left of ulcer.

December 29.—Scab area being encroached upon by healthy skin.

December 31.—Scab area still decreasing in size.

January 3.—Patient entirely comfortable and able to move head and jaws freely. Skin covering ulcer healthy in appearance, absolutely free from tenderness.

Photograph No. 2 was taken January 7. At the time of this publication the site of the ulceration is entirely covered with healthy skin, which is entirely free from tenderness.

In concluding I wish to thank Dr. Skinner for his valuable aid in the successful termination of this case, for the details of its progress under treatment, and withal for his scientific and courteous treatment of both my patient and myself.

235 Dixwell Avenue.

## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN,  
CONN.

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## CHAPTER II.

## APPARATUS.

Three apparatuses are essential in order that the most may be gotten out of dry hot-air therapeutics: a large one for treating the whole body at once; a smaller one for treating hands, wrists, elbows, shoulders, backs, abdomens, hips, ankles, and feet; and a short one, open at both ends as far as the cylinder is concerned, but which can be closed about the limb by flexible attachments, for treating flexed and ankylosed knees. This means that the foot is carried clear through the cylinder during adjustment, the flexible attachment on the distal end fastened about the limbs six or eight inches below the knee, and the attachment on the proximal side fastened six or eight inches above that joint, so that the joint itself is directly over the source of heat.

All of these consist in general of metal cylinders, lined with some non-conducting material and susceptible of being closed at both ends in such a way as to confine the air they contain about the part to be treated. Gas, gasoline, or electricity is used for heating.

The second or medium-sized apparatus is the one most useful in general practice and usually the only one owned by general practitioners. A very important point in reference to its construction is that it be portable, as it is frequently necessary to apply it at the bedside; more particularly in acute diseases, as we shall see later. The body apparatus is of necessity not portable because of its weight and size, and is only useful when the patient can be brought to it, or in sanitariums where stretchers can be utilized.

There are several makes of apparatus on the market, the principle in all being the same, but they differ in construction

and price. The following points are essential, in order that an outfit shall be capable of doing good work. The body apparatus should be capable of generating a heat of at least 350° F. in thirty minutes at the outside, and of sustaining it there indefinitely, and the source of heat should be so arranged that the flame cannot be directed toward the patient without having some non-conducting material interposed, however great the distance between them. It should be provided with valves, whereby the air may be changed frequently without lessening the heat. If free circulation of air in the apparatus is not attainable, it will soon become so saturated with vaporized perspiration that the skin will be in danger of blistering.

The general local apparatus should be easily portable, capable of generating a heat of at least 400° F. in at most thirty minutes, and sustaining it steadily at that point indefinitely. The same requirement as to arrangement of the source of heat in relation to the patient applies here as in the body apparatus, although with more force, because the temperatures used are higher, and free circulation of the air in the cylinder is just as necessary. The knee outfit should also conform to these essential points.

Any make of apparatus that exhibits these features will do effective work, and one deficient in any of them will not. Directions for setting up and operating the outfits are furnished by the manufacturers.

## CHAPTER III.

### TECHNIQUE OF TREATMENTS.

There are two ways of giving treatments, with coverings and without. The latter method is based upon the assumption that the perspiration will be evaporated off from the skin by the high degrees of heat as soon as it is formed, but, while this should be so theoretically, experience teaches that it does not always take place. A large proportion of it does evaporate immediately, and if a low degree of heat (250° F.) is used, it is very satisfactory. But it is ordinarily necessary to employ greater intensities (350° F. to 450° F.) and then the sweat glands functionate so copiously that it is not all vaporized immediately, and the residue becomes hot enough to blister

the skin. Applying coverings obviates this and makes the use of even 500° F. possible for short periods, because, as the covering invests the skin closely, it absorbs the perspiration as fast as it is formed, and its attenuation by distribution through the meshes of the fabric makes easy its conversion into steam by the heat, whence it diffuses off into the air surrounding the part under treatment. The material for the covering should be loose-meshed and as absorbent as possible, and the cheap grades of Turkish toweling have given me greater satisfaction than anything else.

Local.—For treating arms and legs and portions thereof the Turkish toweling should be cut into strips about seven inches wide and five feet long, hemmed and rolled like a surgical bandage. It is applied the same as a roller bandage, not tightly, but closely enough to obtain even an intimate contact between it and the skin. When the toweling is new three thicknesses will be sufficient, but, when it is worn thin by use and frequent washing, four or five will be required. They should be boiled in soap and water, each time after using. After the bandage is applied wind about it, paying especial attention to the creases and recesses, a line of tape with the turns about one inch apart. This will press the toweling down upon the skin where the bandaging has failed to do so, making the contact as perfect as possible. The limb is now ready to be placed in the apparatus, after which it should be again inspected to see that everything is in proper position, and the heat turned on.

The temperature should be allowed to rise steadily until the desired intensity is reached, where it may be maintained by regulating the heat supply. The office of the operator resolves itself, during the treatment, into changing the air in the apparatus often enough to maintain dryness, keeping the temperature steadily maintained at the proper elevation, seeing that the wrappings inside the apparatus do not get on fire, and in preventing the patient from being blistered.

The first two are mostly matters of keeping one's attention on the task in hand. In reference to the third, it is well occasionally to smell of the air which escapes from the apparatus during ventilation, when the odor of the scorching cloth will be detected, if danger is imminent. It is important to look out for this, as the patient who has once gotten on fire and been burned will with difficulty be persuaded to take another

treatment. If the cloth does ignite the first thing to do is to turn off the heat, then remove the patient's limb from the apparatus and dispose of the smoldering fabric. Do not become panic stricken and scare the patient into hysterics. If the mischief has been taken in hand as soon as the odor of combustion is detected, there will be plenty of time to remove it before the fire penetrates to the skin, and all will be well.

As to preventing blisters, it not infrequently happens, even with the greatest care, that the covering has not been closely applied to the skin all over the part under treatment, or the patient's movements, which he should be warned to eliminate as completely as possible, may cause a wrinkle to form. Perspiration will collect on the area of skin not in contact with the absorbent, its temperature rapidly rises toward the boiling point, and the patient complains that he is being burned. If it is not removed, a blister will result. The trouble may be overcome by introducing the hand into the apparatus and pressing the toweling down upon the complaining area of skin, when immediate absorption of the scalding sweat and relief will follow.

It requires a little practice to do this without burning one's own hand. The "knack" consists in getting the hand in on to the part to be "pressed" quickly, and quickly out again. It is well for a beginner to have a cloth glove to put on when he executes this maneuver. It will save much discomfort and some blisters. The burning sensation and the danger of scalding the patient also obtain if the air becomes supersaturated with moisture; hence the necessity of securing free circulation through the apparatus.

For shoulders, back, abdomen, or hip, the toweling should be in pieces eighteen or twenty inches wide and five feet long. When applied the piece should be folded twice, making three thicknesses, applied smoothly and held in place by cloth straps an inch broad passed around the body or portions of it in such a way as to maintain good and even contact between skin and covering, and then the apparatus connected. Heavy cloth attachments, so constructed as to fit these regions of the body, come with each apparatus.

The local treatment lasts an hour usually; less than this is not enough, and more does not increase the effect, under ordinary circumstances. After-treatment of the part, except

wiping with a towel, is uncalled for, usually undesirable, and sometimes positively harmful.

A proper acquaintance with and adequate attention to the technique of these treatments renders burns, scalds, and other accidents entirely unnecessary. Modifications of technique called for in different diseased conditions will be described in the section which treats of these conditions.

**Body.**—Loose bath-robcs made of Turkish toweling constitute the best covering in the body treatment. The patient may assume any position agreeable to him, but as it is necessary for him to remain quiet, and not move his limbs about during treatment, lying upon the back is preferable, unless deformities are present which render the position irksome. Small pillows are placed under the hollow parts of the body so as to give it support without strain. Boots made of the same material and coming to the knees are pulled on over the feet. The robe is then pressed down between the legs and arranged so as to hug the skin as closely as possible and the patient directed not to move his legs after this has been done. Enough medium-sized ordinary Turkish towels are then spread over feet, legs, and abdomen to form three thicknesses, the apparatus closed by dropping the curtain or curtains and tucking them in closely about the patient, and the heat turned on.

Just the right amount of covering to be used will be governed by the condition of the patient as regards profuseness of perspiration and of the apparatus as regards the degree of heat used in the treatment, but should be as little as is consistent with the safety of the integument. Very frequently the robe alone, which constitutes one thickness, will be sufficient. In other cases it will be necessary to cover a portion of the body only, as the feet, abdomen, or thighs, with the extra towels. The patient's sensations are a pretty safe guide in the matter.

The body area exposed to the heat at the first treatment should be the feet, legs, and abdomen up to a point midway between the umbilicus and the nipple line, but may be extended to embrace the whole body up to the neck, in which cases Turkish-toweling mittens are drawn over the hands, if the sympathetic does not respond sufficiently without it. The factors which determine this and the length of the treatment are the degree of acceleration and character of the pulse, the rise in

temperature, and the other reflex phenomena induced, and, as different organizations exhibit different degrees of susceptibility, it is necessary to understand the significance of these signs. Each individual patient must be handled according to his own law.

As we have seen, the pulse can be accelerated and the body temperature raised by the treatment from thirty to fifty beats per minute and from two to five degrees F. respectively, but the normal ratio between them is not maintained, and sometimes one is disproportionately increased and sometimes the other. The respiration is also irregularly increased, as before stated, but this element may be disregarded in this connection, as it possesses no value as an index to stimulation intensity.

The pulse and temperature, then, being adopted as guides, it becomes necessary to ascertain the limit of elevation beyond which it is unnecessary to go, but which must be attained in order that the amount of stimulation which will produce the best results may be known to have been induced; and, from a study of two thousand body treatments given under my personal supervision, I have adopted as a working rule—which is modified in individual cases, according to indications—the plan of treating the patient until his pulse has reached 120 beats per minute, or his mouth temperature is two degrees F. higher than when treatment was begun if it was then above normal, or two degrees above the normal if it was at or below that point. As I have said before, one of these conditions will be attained first in one patient and the other in the next, but the occurrence of either one usually means that a sufficient influence has been secured and that the time has come to stop the treatment. I will say here that the mere induction of perspiration, however profuse, is not an indication that this object has been attained. Comparatively low degrees of heat will often do this. What we want is the deep reflex response, hence the necessity of intelligently thorough treatment. Patients not treated up to this point do not get their due in the way of benefit, and if it is carried much farther the sympathetic centers ordinarily show signs of exhaustion, which is just as bad. Sometimes it will take fifteen minutes, sometimes an hour.

Other reflexes and conditions which are sometimes encountered are nausea or retching, cranial throbbing, headache,

uncertainty or partial loss of vision, mental confusion, and faintness. Laryngeal cough and oppression of breathing are rarely induced, but, as far as my observation goes, only in hysterical subjects.

The occurrence of any of these events calls for the application of an ice-cap to the patient's head, which, with moderate fanning of the exposed portion of the body, will usually take care of the situation perfectly. If they persist in spite of these, however, the heat should be turned off at once and the patient cooled. At the next séance run the heat up more slowly. I have seen but one patient who could not take the limit if handled well, and that was a case of angina pectoris, in which the pain was always provoked when the pulse-rate reached 110. It always subsided kindly, however, on turning off the heat. I shall mention this case later. Water may be given at any time in dessertspoonful doses every two or three minutes, if the patient develops thirst, but should not be administered in large quantities at once.

The after-care of a patient who has had a thorough body treatment is important. My custom is to leave him in the closed apparatus for ten minutes after stopping the heat, then open the apparatus and allow him to cool, exposed to the air of the room for twenty minutes. Usually, by this time, the temperature and pulse will have returned to the normal. The pulse usually subsides more slowly than the temperature, but the patient should not be allowed to rise until it has nearly or quite reached the rate which obtained before treatment, or syncope is liable to result. One of my early patients frightened me sorely before I had learned this point, by falling in a heap on the floor, unconscious and cyanosed, with very slow, soft pulse, on her way from the apparatus to the bath. I had gotten her up too soon.

When the pulse has subsided the patient may sit up and see if it causes nausea or dizziness, and if it does he should lie down again for ten minutes more. If not, he may slowly and deliberately leave the apparatus and sit in a chair, preferably one which can be instantly adjusted to the reclining position if any giddiness or nausea is provoked. If neither of these symptoms appears in three or four minutes, he is ready to be taken to the tepid bath, well soaped, rinsed, and put to bed. He should then have a thorough rubbing with alcohol and be-

left to sleep or rest for an hour, after which he can dress. In some diseases characterized by a marked element of nervous debility, as arthritis deformans, or various neurasthenic conditions, it is well to prolong the period of rest to two or three hours.

As regards scalds, burns, etc., the same cautions and means of prevention apply here as in the local treatments. If changing the air or pressing the covering against the skin does not relieve the "burning" sensation that warns of danger, open up the apparatus and spread another thickness of towel over the spot. No matter what apparatus is used, if the heat is intense enough burning is likely to occur, and constant care should invariably be exercised.

The frequency of application both of the body and local treatments varies with the individual disease and condition, and will be indicated in the section which treats of them.

The belief is entertained by many that patients with atheromatous arteries and valvular lesions should not be subjected to the body hot-air treatment. This is a fallacy. My observations have given me reason to believe that atheromatous arteries are softened and rendered more functional through the absorption of lime salts deposited in their walls and at least partial regeneration of normal-tissue elements, and I have repeatedly treated patients who have had previously one and two cerebral hemorrhages with nothing but beneficial results. In treating these, and patients with valvular lesions, it is well to run the heat up slowly during the first three or four treatments, but I have never encountered the slightest cause for anxiety with them any more than with others, when carefully handled.

We will consider the various diseases in the treatment of which hot air is at present of demonstrated value, as nearly as possible in the order of the importance which it assumes in their therapeusis, viz., rheumatism, sprains, arthritis deformans, nephritis, local septic infection, pneumonia, peritonitis, pleuritis, synovitis, lithæmia, neuralgias and myalgias, varicose ulcers, nervous debility and exhaustion, chronic bronchitis and pulmonary tuberculosis, neuritis, tuberculosis of joints, fibrous ankylosis, miscellaneous conditions.

(*To be Continued.*)

## THE VALUE OF ELECTRICITY IN GYNECOLOGICAL WORK OF THE GENERAL PRACTITIONER.

MARCUS S. WHEATLAND, M. D., NEWPORT, R. I.

Of all the therapeutic measures used in the treatment of diseases of women there is not one more generally useful than is electricity, intelligently applied. It is not applicable to all the ills to which the flesh of woman is heir, but, in suitable cases, it will do more good than any other remedy now used in this class of work because, with it, one can produce opposite conditions; with ease he can lessen congestion, and with equal facility produce it. This, alone, without taking into consideration the other polar and interpolar actions of the galvanic current, places it far above any other remedy. For in states of congestion when conditions seem beyond the power of nature to restore to health, with a few applications of the positive pole, and the resultant contraction of the blood vessels and drying of the parts, nature regains her hold and is able to carry the process to a healthy state. In other diseases in which the controlling factor is a lack of nutrition, anæmia, the negative pole applied to the part produces a hyperæmia which continues for some time, and must be beneficial to organs in an anæmic state.

But the galvanic current has other values besides the power to produce anæmia and hyperæmia of parts; by it, we have the means of diffusing medicaments into the tissues of the body, "cataphoresis," which to the physician doing gynecological work—in which much consists in making applications to the vagina and endometrium—means a great advantage in the treatment of his cases. If iodine will do good for the relief of the after effects of pelvic peritonitis and cellulitis, when applied to the mucous surfaces of the vagina, how much more speedy will be the action of this remedy when diffused into the old and new tissues around and about the uterus; for, although much of the action of iodine when applied to the vagina on tampons is due to its counter-irritation, there is a certain amount absorbed, which exerts its influence on the tissues of the parts involved.

Another important feature of the galvanic current which is often called into use by the gynecologist is its electrolytic ac-

tion, by which the fluids of the body, in the passage of the current through them, are decomposed into their constituent elements, and under its influence many new compounds are formed. Acted upon by the law of electrical attraction, these separated elements of the complex molecules of the fluids of the body—now called ions—according to their electrical quality migrate to one or the other of the poles. The electro-positive radicals, “cations,” move to the negative pole, and those of electro-negative quality, “anions,” are found at the positive. At the negative pole we find the alkalines—soda, potash, lime and ammonia, and free hydrogen; at the positive pole free oxygen, chlorine, and the acids—hydrochloric, nitric, sulphuric, and phosphoric. These elements and compounds exert their specific actions at their respective poles. At the negative, the action is one of congestion, softening, relaxing; at the positive, the tissues are blanched, hardened, and dried in proportion to the strength of the current used. The catalytic and electro-tonic actions of this current are not without influence in the sphere of gynecology. To the former is ascribed the interpolar, electro-sedative, and alterative effects of the current, and to the latter its influence on the nervous system.

The faradic current is as necessary to the general practitioner in the treatment of his women patients as is the galvanic. By it, with a coil of proper construction, he is able to produce stimulation and sedation, depending upon the length of wire used in the secondary current and the rate of interruption in the primary for the accomplishment of the object desired. In a general way, it may be said that a long wire with rapid and smooth interruption will produce sedation, and a current from a short wire with slow vibration, stimulation.

In the first treatments of many cases of pelvic inflammation which find their way into the doctor's office, only currents from very long wires with the most rapid interruption are tolerable, and it is here that the practitioner receives the value of the money expended in the purchase of a first-class coil, for only the best is of service in these cases. While the polarity of the faradic current is not as distinct in its physiological action as is the galvanic, it is still well marked, and is similar to the galvanic in that the electrode attached to the positive pole is more sedative, and that to the negative more stimulating to nerves and muscles. In inflammation, by its action on the

nerves and smooth muscles of the dilated blood vessels, the vascular walls are made to contract, their contents are pushed on in the general circulation, and the patient is relieved from pain and discomfort. It has not the resolving effects of the galvanic current, but, by its tonic action on nerves, and its power to stimulate to contraction unstriped muscular fibers, pelvic adhesions are severed and their rapid absorption promoted.

To apply electricity to the patient, electrodes adapted to the various parts of the body are required. Those I use most frequently are the bipolar vaginal, hydro-electric vaginal douches, the carbon-ball electrode, and the various electrodes used for the diffusion of copper, zinc, silver, and mercury into the tissues of the uterus and vagina. I also use an aluminium cataphoric uterine electrode with flat spiral end for holding absorbent cotton, which is saturated with the solution to be diffused into the uterus in cases where the action of iodine is preferred to the salts of zinc, mercury, or copper. I have a modification of this electrode which I hope to have the pleasure of showing to you.

Before I began to use electricity, I employed a Skene glass pipette for applying iodine to the endometrium, because it had appeared to me that, when the cotton-covered sound passed the internal os, there was not much of the medicament left to be swabbed over the endometrium. This same condition prevails in connection with the applicators I have seen offered for sale by the instrument-makers. My instrument has a small syringe attached to the proximal end by which cotton can be saturated after it has been placed in position, insuring a sufficient quantity of the medicament present when the electric current is turned on.

For an indifferent electrode, I prefer the Massey wire cotton pads, made according to instructions in his recent work on *Conservative Gynecology and Electro-Therapeutics*. With these wire cotton pads, in treating fibroid tumors of the uterus, I have been able to give stronger currents with less discomfort than with the ordinary felt-covered electrodes obtained from the shops.

The class of cases in the treatment of which I employ electricity are the following: dysmenorrhea, amenorrhea dependent upon local conditions, endometritis, metritis, subinvolu-

tion, pelvic peritonitis, and cellulitis, when pus is absent; catarrhal salpingitis, uterine fibroids, and the symptoms which go along with them.

To substantiate my claims, I desire to mention the three following cases:

(1) Miss Mary S. (colored), age thirty-one, occupation housemaid, menstruated at fourteen. Thinks she took cold at this time, from which she never completely recovered; had always to go to bed for three days during each menstrual period. Her acute disability began about five years ago, when she was taken with what must have been ovaritis and pelvic peritonitis—the extension of an inflammation in the uterus. Had been in hospital, once in New York and three times in Newport; two of these times she was curetted, at the other times local applications were made to the parts. From these various attempts at cure she received no relief, and for two years before coming to me she had nothing but morphine to relieve her pain during the menstrual period, because it was believed by the attending physician that nothing short of a radical operation was the thing that would make her life worth living. To this she objected, and came to me, a little over a year ago, for advice. I took up her case with many fears, because I knew she had been in first-class hands. Her condition at the time was as follows: pale and careworn, appetite poor, inability to stand or walk without pain, had been an invalid for four years. On digital examination I found her very sensitive, the uterus large, and could not be touched without causing sharp pains. It was adherent, both ovaries extremely sensitive, the right one prolapsed. With difficulty I inserted the speculum and saw that the walls of the cervix were thickened, congested, and eroded, the os small, and could with difficulty be made out—it seemed as if the inflammation had closed it.

For her general condition she was given the following:

B Hydrarg. chloride corrosiv.....	gr. $\frac{4}{5}$
Acidi arsenosi.....	3 ij
Tinct. ferri chloridi	{
Acidi hydrochloridi dil }	aa 3 vi
Syr. limonis qs ad.....	$\frac{3}{5}$ iv
M Sig 3 i in water after meals, and strychn. sulph. before meals for her appetite.	

Locally, I began by using the high-tension faradic current with the bipolar vaginal electrode, keeping the current up to the point of tolerance, and continued this treatment until the sensibility of the parts was reduced, after which I began with the galvanic current from ten to forty ma., using the carbon-ball electrode covered with cotton, soaked in bicarbonate of soda solution and attached to the positive pole for its anti-congestive, drying effects.

As the case improved, I used the intrauterine electrode attached to the negative pole for its electrolytic action on the inflammatory products. Finally, I was left with nothing to contend with but an obstinate leucorrhœa and an eroded cervix, which in time yielded to metallic electrolysis from a zinc amalgam electrode attached to the positive pole of the galvanic. I closed each treatment with an application of the faradic for five or ten minutes, and the insertion of a tampon saturated with 10 per cent. solution of ichthylol in glycerin. During my treatment of the case I never found it necessary to prescribe an opiate. I would say, however, that, along with her general tonic, she was given a mixture of the viburnums for their sedative action on the parts. At first she came twice a week for treatment. After two months she so improved as to permit her coming but once a week. This she continued to do until near the end of the treatment, when I found that the application of metallic electrolysis once a week to the eroded cervix rather retarded the further progress of the case, and she was instructed to come twice a month until the erosion of the cervix healed. She came into my office Thursday, August 8, 1901, and on examining her I found her parts normal, excepting that the os uteri seems rather small. Since coming to me she has not had to go to bed during her periods more than three times, and those times were in the first months of the treatment. The menses are now regular, preceded by only a slight feeling of uneasiness in the back. The patient has been under observation since January, 1900. After four months' treatment she so improved that she felt able to go to work, which she has been able to do without interruption up to the present time. While her work did not cause her pain to return, I believe it had much to do with keeping up the obstinate leucorrhœa, to relieve which took most of the time she was under observation. An agent capable of transforming an invalid

into a self-supporting member of the body politic, as it has done in this case, is deserving of serious consideration.

(2) Mrs. Anna D., colored, age thirty-nine, occupation general housework, came to my office December 12, 1900, to consult me with reference to a large tumor, which filled the entire abdomen and caused her great uneasiness. Urination was very frequent—every half hour during the day, and three or four times at night after going to bed. She had a constant desire to go to stool. On examination per vaginam a large mass was found well down in Douglas' cul-de-sac; posteriorly and anteriorly there was much pressure of the growth against the bladder, which accounted for the constant desire to evacuate the bladder and bowels. Her periods were painful, but the flow was not excessive. She was opposed to an operation, and asked me what I could do for her. I promised her nothing. I told her that perhaps the only thing that stood between her and an operation was electricity, and if she was willing to give it a trial, I should be glad to do all I could for her. She took her first treatment that day. It consisted of a negative intrauterine application of 40 ma. for ten minutes. Two pads, one on the abdomen and the other under the back, were attached to a bifurcated cord connected with the positive pole of the battery. These treatments were continued once a week, and the current increased until about 140 ma. were tolerable. I discontinued the treatments in July. She returned to my office September 7, 1901, and tells me she has been reduced four and one-half inches around the waist; that when she began treatment she measured 44 and one-half inches, and her measurement now is forty inches. Her pressure symptoms have long disappeared, the tumor has been reduced about one-third; and she feels about as well as she ever did. I look forward to a greater reduction of the tumor as time goes on, and see no reason why I should be afraid to say that electricity has been a great blessing to this woman.

(3) Miss Annie M., age twenty-four, occupation housework, consulted me after she was told that it was necessary to perform a hysterectomy to free her from attacks of retention of urine which come on during each menstrual period, and from the slightest exposure.

I examined her and found a tumor about 2 1-2 inches in diameter pressing against the bladder. There was a marked en-

dometritis. I began the treatment of this case by intrauterine applications of the positive pole for its anti-congestive effects, using a platinum electrode and a current from 30 to 120 ma. for from ten to twenty minutes. The séance was closed with the faradic light-tension current for ten minutes (leaving the electrode in the uterus for this) and the insertion of a tampon of 10 per cent. ichthyl in glycerin. She came once a week for treatment and continued until last June, when all the symptoms had disappeared, including the leucorrhœa. She was then told to discontinue her visits for a time and note the result. During the first three months of the treatment I was called to her house three times to pass the catheter—since then, she has been free from discomfort. The tumor is smaller than when treatment was begun, and another effort will be made in a few weeks to further reduce its size.

Dr. Wheatland also presented and described a modified electrode for intrauterine cataphoresis. The modification con-



sisted in the adaptation of a syringe so that the cotton, after its introduction into the uterus, could be saturated with the selected medicament.

#### DISCUSSION.

Dr. G. Betton Massey did not think one could readily exaggerate the importance of making easy for the general practitioner the electro-therapeutic methods adapted for his use. It was, however, a question whether it was wise to place the instrument just presented in the hands of the general practitioner. Some recent work of his own had shown an additional means of reaching cases of severe disease of the uterine adnexa—he referred to the use of the mercury electrode instead of cotton-covered electrodes in the vagina. It was, of course, connected with the positive pole, and the application was pushed to the point of causing considerable discomfort to the patient by producing erosion of the vagina. He had recently had a case in which a woman had been condemned to removal of the appendages on one side. There was a history of specific infection, and thinking the local disease might be specific in its nature, he had made use of a vaginal electrode

coated with mercury. The treatment had been employed three times a week with intervals of rest for several months, and had resulted in a practical cure.

Dr. F. B. Bishop said that the instrument exhibited appeared to him unique, and one that should be useful unless there was danger by its use of injecting air.

Dr. Wheatland replied that it was a very easy matter to apply the cotton and exclude the air before inserting the electrode.

Dr. O. S. Phelps of Battle Creek, Mich., said that he had had no experience with this cataphoric intrauterine application, having confined his efforts during the past ten years to metallic electrolysis. By the latter method a double decomposition resulted from the action of the current on the electrode, and upon the tissues. When driven into the tissues in the nascent state, these decomposition products were very active.

A comparatively small number of drugs could be so used. Metallic electrolysis seemed to him to give all the possible advantages of cataphoresis with the minimum of disadvantage. An experience of over thirty years in gynecological work convinced him that metallic electrolysis was far in advance of all other known methods of treating chronic endometritis. He first introduced the sound to determine the direction of the uterine canal, and then applied the cathodic current preparatory to the introduction of the electrode. When the cathodic current was thus used the secretions were completely dissolved, and the mucous surfaces cleansed and prepared for the application of the chosen remedy. To use electricity in gynecological work successfully, however, the physician must first of all be a practical gynecologist; hence all methods and remedies were unsafe, except under these conditions. To use electricity successfully in gynecology, the operator must thoroughly understand electro-physics and electro-therapy.

Dr. Robert Reyburn said that his experience with electricity in the treatment of fibroid tumors had been for the most part very good, particularly in his last six cases. The electrical treatment of fibroids was, of course, not so brilliant as the extirpation of the fibroid, yet his experience was that the tumors were sufficiently reduced to stop the hemorrhages and restore the patient from a condition of invalidism to one of nearly perfect health. Increasing experience made him more and more opposed to the use of the knife. He believed the use of the knife, particularly in cases of cancer, had been a stupendous failure. Usually after a tumor had been removed by the knife the woman was far from cured. He was opposed to the indiscriminate use of the knife, and believed it was employed five times more frequently than it should be. He had used electricity in a current strength of 50 to 75 ma., and had succeeded in this way in effecting practical cures.

Dr. R. J. Nunn of Savannah said that he had not intended to make any remarks at this meeting, but the introduction of this instrument had led him to change his mind. He was sure that many practitioners had made use of a similar instrument for years. It was certainly an old idea to inject fluids into the uterus, and the same reasons which had led to the abandonment of this treatment seemed to him to constitute an argument against the use of the instrument presented. The danger of such treatment was, of course, the injection of fluid into the fallopian tubes. Carbolic acid, iodine, and certain other substances, however, could be introduced easily. He laid it down as a rule, if one must introduce a sound into an os so contracted that it would squeeze out the medicament on the cotton applicator, that such a procedure was a dangerous one. The remedy consisted in securing a larger opening before introducing the medicament. Again, the plugging of the os by the instrument served to increase the risk of fluid being injected into the fallopian tubes. He had found no difficulty in introducing fluid into the uterus, if a proper technique were employed and a suitable sound used.

Dr. Wheatland said that he had been using Skene's pipette for about four years, and had that in mind when constructing this new instrument. He did not intend to imply that the whole syringeful of fluid was to be injected into the uterus; the object of attaching the syringe was to enable one to easily supply sufficient fluid for the purpose of cataphoresis. The instrument was intended to be used with the positive pole in inflammatory conditions of the uterus, when the action of iodine on the tissues was desired.



## HOT-AIR TREATMENT OF RHEUMATISM.\*

BY J. D. GOLD, M. D., BRIDGEPORT, CONN.

My object this evening is simply to call your attention to the therapeutic uses of hot air, especially in rheumatism, and report upon several cases treated by myself with excellent results.

Hot air in the treatment of disease has been of universal use for many years, first in the form of the Roman and Turkish baths; later, the hot air box, in which the patient sits, only the head protruding from the box; heat being generated by an alcohol lamp. These methods had this disadvantage, the inability of raising the temperature to its full beneficial limit, and thus receiving the therapeutic value of the higher temperatures.

Tallerman of London in 1893 provided an apparatus by the use of which the temperature could be raised to 250°—350° F., or higher, and demonstrated its value in the treatment of disease. After that it was used extensively in the hospitals of London and Paris.

Dr. V. P. Gibney demonstrated its use in 1896 before the Practitioners' Society in New York. Dr. James Stewart of Montreal before the British Medical Association reports that, after considerable experience in cases classed as rheumatoid arthritis, he found superheated dry air the best means of treating them. In a more recent article by Dr. V. P. Gibney he gives it as his "experience that the hot-air treatment in multiple arthritis with deformity, has been disappointing. I could relate two or three notable instances in which this treatment has been employed most persistently and faithfully, with no better result than has been obtained by other methods as faithfully carried out." He states further, "there is usually a temporary relief, but at later periods the cases are either in statu quo or, if anything, worse."

Dr. G. L. Kessler of Brooklyn, who is Medical Director of the Sprague Hot-Air Hospital, says, "Careful observation during the last year [1900] leads me to conclude that hot dry air is a very valuable adjunct in the treatment of numerous

\* Read before the Bridgeport Medical Association, July 2, 1901.

diseases, and is especially indicated in rheumatism and gout."

Dr. T. E. Satterthwaite of New York in an excellent article calls the attention of the profession to the use of superheated dry air as a therapeutic agent, and says that it has a "wide field of usefulness, more especially in chronic articular and muscular rheumatism."

Dr. C. E. Skinner, physician in charge of the Newhope Hot-Air Sanitarium in New Haven, Conn., says, in acute and chronic articular rheumatism "hot air is an agent unequaled in its efficiency in conjunction with the salicylic acid derivatives." In neuralgias it "is almost universally and positively curative." In gonorrhreal rheumatism, "hot air is unquestionably the very best treatment known."

In sprains, if treated early with hot air, the relief is immediate, and cure follows in two to four days; where effusion has taken place, cure results in one to two weeks. Myalgia yields as kindly to the treatment as acute articular rheumatism. In conclusion he writes, "hot air has given me more satisfaction than any other therapeutical measure that I have encountered since I began to practice medicine." In arthritis deformans he reaches the same conclusions as Dr. Gibney; hot air alone is disappointing, but, with the use of the body apparatus and statical electricity, the results are better.

**The Apparatus.**—There are several different styles manufactured, but all embody the same principle. I have used myself the Betz apparatus, manufactured near Chicago.

We have first the large body apparatus, arranged with a sliding mattress; the patient, being placed thereon, is easily pushed into the apparatus, ready for the treatment. This is designed and better adapted for hospital use. Then we have a smaller one, for individual parts of the body, and another for treating the knee only; these two are not large, and can be carried conveniently to the patient's home. They are made of galvanized iron (inverted U in shape), lined with asbestos, either closed at one end, with a metal cover, or by canvas fittings so as to conduct the heat readily to the part requiring treatment, when it is not possible to place the member to be treated within the apparatus. On the top there is a fitting for a high-temperature thermometer, a slide to allow hot air to escape when necessary, and to improve the circulation of the air. The heat is generated by gas, gasoline, or alcohol, is ad-

mitted from below, and distributed by a carrier, evenly throughout the apparatus. A sling within is used as a rest when treating an arm or a leg. The part to be treated should be evenly and smoothly covered either with flannel, or Turkish toweling, two to five thicknesses, to absorb the perspiration and thus avoid scalding. Each treatment is of about one hour's duration. The temperature varying from 250° to 400° F., as the patient is able to bear it.

The following conditions are found to prevail during or after the treatment. Body temperature raised from 1-2° to 3° F., falling to normal within one hour after treatment; pulse accelerated 5 to 20 beats per minute, full and strong; a weak heart, if gradually accustomed to the heat, is stimulated and the treatment beneficial. There is flushing of the surface of the body, showing dilated capillaries, especially about the part treated; perspiration is profuse, which, as observed by Dr. Kessler of Brooklyn, is strongly acid; the sebaceous glands are very active; the lymphatics are stimulated, facilitating absorption of abnormal deposits about rheumatic and gouty joints, and in the tissues; the kidneys are stimulated to greater action, with increased amount of uric acid; respirations are increased four or five to the minute; there is a decided soporific effect in most cases, the patient falling asleep after the treatment; occasionally during it. The patient notes a decided relief from pain, with a general sense of ease and comfort. Most patients complain of thirst, for which cool lithia, or spring waters are most beneficial, aiding the activity of the skin and kidneys.

In all the cases treated by myself I have used the salicylates and other rheumatic remedies freely, in conjunction with the hot air, and am led to conclude that all were greatly benefited, and cure hastened, especially so the cases of acute articular rheumatism; the duration of the disease was shortened, and the acute suffering from swollen and inflamed joints to a marked extent relieved; the inflammation rapidly subsiding inside of twenty-four hours. In acute and chronic muscular rheumatism hot air gives almost instant relief; one treatment in many instances affording great comfort, with the entire absence of pain afterwards.

I cite the following cases as illustrations:

Case I.—Mr. L., aged thirty-five, born in Sweden, polisher

and buffer by trade. Had an attack of acute articular rheumatism early in November, 1900. First the wrists, later the elbows and knees, running the usual course—swelling, redness, and pain; the joints returning to their normal condition in about one month. At this time began a severe pain and soreness in the lumbar region, with inability to move without great discomfort; this condition prevailed up to the first time I saw him, February 21, 1901. I immediately employed the hot air, giving one treatment daily for nine days; he began to improve from the first, and by the seventh day the soreness and pain were entirely gone; the last two treatments were given as precautionary measures. The patient was discharged cured, returning to his work in sixteen days, from which he had been absent about four months; an excellent example of the good hot air will do.

Case II.—A case of sciatica. A gentleman, eighty-three years of age, never had had rheumatism in any form; always led an active, busy life. The pain and soreness in the right sciatic nerve came on gradually, for about one month, when extra exertion and excitement precipitated the disease, May 30, 1900. Salacetin internally, galvanic current, tr. iodine, and hot cloths locally gave no relief; the pain being constant, with the attending restlessness and sleepless nights. Hot-air treatments were started June 10, and continued daily for about three weeks; improvement being gradual from day to day. In this case I want to call your attention to the immediate relief from pain upon each occasion of applying the heat, the patient in almost every instance falling asleep, resting comfortably, during, and for several hours after, the treatment. Wine of colchicum, fl. ext. cimicifuga and K. I. were given internally, and later a solution of ichthylol, with equal parts of camphor and chloral hydrate, was applied locally.

By August 1 he had regained his usual health, and has remained free from pain and lameness up to the present writing. I am fully convinced that the hot air in this instance was of great assistance in relieving the pain, inducing restful and quiet sleep, and hastening the cure.

Case III.—In gonorrhreal rheumatism of the knee, one case especially, where the disease had continued from four to five weeks before trying the hot air, all remedies seemingly valueless, hot air was used continuously for over a month, two

treatments daily, of one hour each, and the temperature each day raised to 350°-400° F. Improvement was marked from the first, and continued until a cure was effected. In this, as in other instances, the relief from pain and the comfort induced by the heat were gratifying; insuring a good night's rest. Later, when the soreness had left the joint, after each treatment gentle passive motion and massage were employed. I attribute the return of the knee to its former usefulness and motion to the use of hot air, and consider it an excellent treatment for the disease.

In cases of acute articular rheumatism, two cases were recently treated, in which I used the hot air in conjunction with 5-gr. doses of sodium salicylate. Each joint, as it became swollen and painful, would yield, inside of twenty-four hours, to the hot air; swelling, pain, and redness rapidly disappearing; the patient resting comfortably in every instance, in these cases the duration of the disease was shortened at least one week.

In conclusion, I believe that hot air is of especial value in acute and chronic articular and muscular rheumatism and neuralgias, and I am convinced that the therapeutic value of hot air is not fully appreciated by the general practitioner, and the use of this beneficent agent for sick and suffering humanity will be more general, and results very gratifying and surprising in the future.

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## **Editorial.**

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### **THERAPEUTIC DISCRIMINATION.**

**T**HE physician's utilities comprise distinct types of therapeutic means of which drugs, and the forms of physical therapeutics are of most importance.

Medicines have been recognized from the earliest times and an acknowledged merit insures their continued employment. The list of officinal drugs is being constantly enriched by the addition of new and valuable chemical products, and the pharmaceutical chemist is also fertile in furnishing elegant combinations, many of which are excellent.

At no time in the history of the profession has the physician been called to face a problem so full of possibilities and at the same time so fraught with the danger of adopting a plan of prescribing which might prove disastrous. Judicious discrimination and exclusion of useless and redundant remedies tax professional skill and determine careers. Most prudent practitioners wisely confine themselves to a limited and select list of valuable means, certain in action and of known limitations, and rely upon nature and regulation of habit and diet to work out a possible cure.

Not a few cases will be best served by measures that belong to a class distinct from the drug list, and usually to be preferred when they attain the same end in a more natural way. As the methods of the profession become more scientific the result of extended research in the fields of physiology, organic chemistry, histology, pathology, and diagnosis—the physician is afforded the opportunity of forming more accurate conclusions as to both indications and results which have already shown a positive tendency to the adoption of a more rational system having a physiological basis.

Surgery is so closely allied to therapeutic measures that it is often most difficult to determine which should be adopted.

The advance in the employment of the forms of physical therapeutics already places a large number of conditions beyond the necessity of surgical interference. The use of electricity of high potential, hot air, and water in various ways, for the relief of inflammatory and painful conditions, of galvanism for electrolysis, of the X-ray in cancerous and possibly tubercular affections, and the early use of therapeutic exercise in moderate deformities, is certain very often to anticipate surgery.

Wise conservatism, as compared with the heroics in medicine in the olden time and to some extent in the surgery of to-day, is certain to be the future keynote of the profession.

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#### **INCREASING INTEREST IN THE USE OF THE X-RAY.**

A REVIEW of the current medical literature shows an encouraging reaction in favor of the employment of the X-ray, which is coincident with a progressive improvement in the character of work done. Few indeed of the standard periodicals do not contain in most issues some substantial recognition of its value, both for diagnostic purposes and as a therapeutic measure.

The increasing display in such publications of radiographs showing excellence of detail marks the improvement in general technique and apparatus.

With the present knowledge of the properties of the rays and the means of prevention, the cases of so called "X-ray burns" have become very rare. That they will occur, however, in some instances with cautious operators is certain, and it should, therefore, be employed as anaesthetics are with regard to possible accidents, and should stand in the same position in the medico-legal aspect—that when proper precautions are observed responsibility ceases; the patient himself having been made cognizant of possible accidents.

Surgeons now appreciate the fact that *some* results are difficult to obtain, and too many consider all unsatisfactory or unreliable. We have discussed the reason; and in improved means of localization and a better technique to prevent distortion, and skill in interpretation, we have the remedy.

No greater mistake can be made than to expect good X-ray work to be done by anyone who has the necessary apparatus, and it should be considered a department of medicine requiring the special qualifications of a medical man, who has had the requisite training. A proper sentiment should restrain members of the profession from employing others than physicians to do their work—as well send a patient with errors of refraction to an optician.

The progressive improvement in apparatus is notable. Though many redundancies and inferior machines are offered to the trade and absorbed by the uninitiated, there are now several valuable ones upon the market.

The Weigel X-ray stereoscope, a cut of which is shown elsewhere, has added a means of most accurate localization and study, which affords a new realization of the art to the observer, who for the first time sees the demonstration.

It reflects great credit upon both the doctor and the manufacturers. The technique of its use requires some extra pains-taking, but the results will warrant the trouble.

It is to be hoped that the time is not distant when the art of radiology will be technically taught in every medical college.

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#### **THE TWELFTH ANNUAL MEETING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSO- CATION.**

IT is officially announced that the next annual meeting of the Association will be held at the Hotel Kaaterskill in the Catskill Mountains, on the second of September, 1902.

The selection of this picturesque resort will afford those who can attend a pleasure which we are certain will be appreciated. Few indeed are the scenes which surpass the panorama there spread out before the observer, in a climate cool and delightful. The music and other features of entertainment will make the occasion enjoyable. We have reason to believe that it will be the best attended and most successful meeting in the history of the association.

## Progress in Physical Therapeutics.

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### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### *Galvanism as a Remedy for Uterine Hemorrhage.*

Dr. Edwin Walker of Evansville, Ind., read a paper on this subject at the meeting of the American Association of Obstetricians and Gynecologists, held in Cleveland, Ohio, September, 1901. He stated that galvanism as a remedy in gynecology had been unduly lauded and condemned. Apostoli's method commanded the respect of surgeons, but the results had not been commensurate with the claims and had not been without danger. The minor uses of electricity partook of the character of tinkering, and were objectionable. There still remained a limited field in therapeutics for it, but it did not replace surgery. Its use in uterine hemorrhage was quite satisfactory. It should not be used where the cause of the hemorrhage could be removed by a clean surgical operation. In mild cases, in which the hemorrhage was practically the only symptom, and where no radical operation would be entertained, galvanism was the remedy. In another large class of cases where grave disease in other organs contraindicated an operation, relief, and often a cure, could be effected. Accurate diagnosis of all lesions in each patient was of the highest importance, so that life should not be hazarded by an operation in the presence of a serious lesion elsewhere which was overlooked, or the patient, even if she recovered, was not benefited, for the same reason.

The method of application was quite simple. The positive pole was attached to a platinum electrode and introduced into the uterus; the negative pole, attached to a copper plate covered with moist absorbent gauze, was placed over the abdomen. The current was gradually turned on until a distinct burning was felt under the negative pole, and continued from ten to thirty minutes. Strict asepsis was necessary. The application was not painful. From two to eight applications were required.

Dr. C. C. Frederick of Buffalo stated that electricity had to a certain extent been replaced largely by surgical procedures. In the experimental stages the results that had been promised by the use of electricity by a great many who were enthusiasts were not borne out. Practitioners met with poor success.

with it, and in consequence became disgusted and abandoned it, and were now depending upon massage and surgical procedures to control uterine hemorrhages.

Dr. Hayd had used electricity for many years; in fact, for five months he had worked with Apostoli; consequently, he spoke advisedly. When he considered the amount of good that had been done with it in treating pelvic troubles, and compared it with the amount of harm wrought, he felt that it would have been the best thing if practitioners of medicine had known nothing about intra-uterine galvanization.

Dr. Price expressed the belief that the application of electricity had a great deal to do in favoring the growth and development of fibroids, rather than preventing or arresting them. He detailed two or three such cases.

Dr. Carstens referred to the various causes of uterine hemorrhage. In all cases of excessive hemorrhage there was some cause for it. Sometimes the cause was constitutional and required simply constitutional treatment, but no operation. In other cases the hemorrhage was indicative of malignant disease of the uterus. If the use of electricity was advocated in these cases, and the information was circulated among general practitioners that this agent was good for uterine hemorrhage, the result would be that a great many cases of beginning cancer of the uterus would be treated for weeks and months, and the golden opportunity for removing the disease by early and timely surgical measures would have passed, and a diagnosis would finally be made too late. He argued against the indiscriminate use of electricity for uterine hemorrhages.—*New York Med. Jour.*, November 16, 1901.

[It is well at times to see ourselves pictured by "our friends, the enemy," but this is really too kind. If the general practitioner is not to use electricity because of the alleged harm wrought by it, if he is not to "tinker," what must he do for his patient? According to the reasoning apparently presented to us at this symposium it is safe for the general practitioner to forcibly dilate the uterus and vigorously scrape it with a sharp curette. Surely the gentlemen do not mean this. Is not the surgical literature of gynecology sprinkled just now with warnings against the dangers of the sharp curette, even in skilled hands?

But possibly the speakers meant that skilled operators should be called in for the treatment (not necessarily, of course, themselves). The answer to this is that the general practitioner with a good office technique in gynecology does his patient an

injustice to send her away from home, when he can render proper service himself.

Whether the operator be skilled or unskilled, it remains as a fact, attested by many physicians throughout the country, that the positive pole of the galvanic current is a safe, and better agent to use in uterine hemorrhage than the curette. With proper skill, and the invariable use of a meter in all internal applications of electricity (which the reader of the paper seems to have neglected), all risk whatever is eliminated from the electric treatment of hemorrhages of the uterus and their causal conditions.

The objection also urged that the use of electricity may postpone a diagnosis of malignant disease applies equally to any remedy employed by a careless diagnostician. The electric current, in fact, in the shape of powerful cataphoric applications of electrolyzed mercury, is to-day the most promising means of stamping out cancer of the cervix. The use of mercury on the zinc anode, moreover, is a distinct improvement on the ordinary Apostoli treatment of hemorrhagic conditions; and this variation of the method is capable of effecting a cure in the incipiency of malignant infection before a positive diagnosis can be made.

As for Dr. Price's discovery about the fibroids, he should give us the data of this unique experience.—G. B. M.]

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#### "TINKERING" IN GYNECOLOGY.

IT is not to be doubted that those true ornaments of our profession, the abdominal and pelvic surgeons, whose work, when necessary, represents so brilliant a portion of modern surgical progress, often meet with sad results of improper minor gynecology. But, because these cases were badly treated by dilatation, curetting, and what not, it does not follow that the extreme and destructive measures in which these gentlemen are alone interested should be employed. The question of which is proper to be done remains still one for the reconstructive hand and brain; at least until the possibility of a restoration of normal conditions is eliminated. Destruction and reconstruction are not synonymous terms, and their utter difference is accentuated when measured in the bodies and

lives of those unfortunates who might have been restored by a proper "tinkering." [G. B. M.]

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## EYE, EAR, NOSE, AND THROAT.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.

### *Rapid Dilatation of the Eustachian Tubes.*

The mechanical method simply stretches the stricture, which soon returns to its former condition. In the more obstinate cases the electrolytic method is preferable, as it is of permanent benefit.

The bougies are made of gold, and are passed through a silver catheter insulated with a thin rubber tubing. The catheter is carefully inserted into the mouth of the eustachian tube, which had previously been cocainized, and the bougie pushed forward until it meets with an obstruction. A current of three or four milliamperes is then passed for twenty seconds to one minute, when the bougie will be found to pass forward with slight resistance, the patient at the same time hearing a "frying" sound characteristic of the electrolytic process. The patient holds the positive electrode, while the bougie is attached to the negative pole. The application should not be repeated for a week, so as to allow the reaction and congestion to subside. After sufficient dilatation has been obtained, the usual treatment by inflation and vaporization should be carried out.

This method should be attempted, however, only by those who are familiar with the manipulation of the catheter for the eustachian tube. As the parts are cocainized the patient cannot render any assistance from his own sensations, and it is thus quite easy to injure the naso-pharynx or the eustachian opening. Even the correct electrolyzation of the eustachian tube may produce ulceration and consequent retraction, so that the method should be followed only in the most careful manner.

Dr. Linhart (Columbus Medical Journal) reports several cases of stenosis of the eustachian tube, which were treated with marked benefit by means of the electrolytic dilatation of the eustachian tubes. [W. S.]

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### *The Cautery in the Early Ages.*

The use of the cautery was a favorite remedy for all sorts of affections (Jonathan Wright, *The Laryngoscope*, October,

1901). Baas relates how Mahomet, instead of resorting to a more spiritual and miraculous method, advised a friend suffering from angina that he should have an application made of the actual cautery. Johannus Mesua Damascenus advised (Opera, Venice, 1589, Lib. II, De Ægritud. Narium, cap. 6.) the use of forceps for the removal of polypi and afterwards the cauterization of their roots, or else the use of hot forceps, but if this method was impossible he used the horsehair string.

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### *Radiotherapy in Ophthalmology.*

E. A. Nesnamow describes in Westnik Oft. (Jour. Am. Med. Ass.) his experiments with radiotherapy of the eye, applied according to Finsen's principles. After convincing himself on rabbits of its efficacy, he tried it in several clinical cases with surprisingly beneficial results. The portion of the human eye which contains no blood vessels is peculiarly adapted to be submitted to the action of the violet rays. Severe suppurative affections of the cornea were improved by this treatment so that operation was rendered unnecessary. Suppuration after a cataract operation was arrested and retrogressed under the influence of the rays. The light seemed to soothe the pain. No injurious effect on the retina was observed.

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## DERMATOLOGY.

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

### STATIC BRUSH-DISCHARGE FROM HIGH-TENSION ELECTRODES.

WHEN in Paris in the spring of 1900, I spent some time at the clinic of the lamented Apostoli. While there my attention was especially attracted by the local use of the high-tension, high-frequency current of d'Arsonval, by means of a copper-rod electrode, covered with a glass tube and having an insulated handle.

This electrode is used from one pole of the exciter, and, when in use, the tube is luminous with millions of small sparks. When applied to the body the sensation is not disagreeable. The electrode is used by rubbing it over the diseased surface, in contact with the skin, or over the clothing. Such affections as chronic eczema, old ulcers and ulcerated conditions of the

legs and shins; also fissure of the anus were treated almost daily by this method, with very gratifying results.

After investigating the current I decided that I could get the same results from my static machine, and so brought with me from Paris a supply of the high-tension electrodes and found my surmise to be correct. To produce the current, I rig my machine as for the production of the "Morton wave current," except attaching the active pole to the high-tension electrode instead of to the tinfoil of the Morton wave current, and it is applied by rubbing over the diseased area. The strength is regulated by the length of the spark-gap between the balls of the discharging rods. In eczema and chronic ulcerated conditions, which react badly or too much to the brush discharge, in my hands, frequently do well with this current. The beneficial action is brought about by the improved circulation and nutrition, and no doubt the ozone set free at the surface is also beneficial.

J. D. G.

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*The Treatment of Cutaneous Epitheliomata* (New York Medical Journal, November 9, 1901).

The conclusions presented by Dr. C. W. Allen are: (1) Cutaneous cancer can be traced, in almost all instances, to preceding local irritation. (2) While other causes may be operative, it is not unreasonable to assume that infection may be one source of irritation occasioning cancer. (3) Benign epitheliomatous proliferations of infectious nature transmitted by contagion lend weight to this view. (4) Cancer is curable, but the disease may be allowed to progress until the patient no longer is. (5) No treatment short of the most radical measures should be tolerated. (6) In the application of caustic pastes and subsequent cauterizing dressings we possess a method not alone radical, but one which is in many conditions preferable to the knife. (7) The earlier treatment can be applied, the less likelihood is there of recurrence or of subsequent outbreaks in other parts due to cancerous tissue which has been left behind. (8) The X-ray as a means of treatment bids fair to prove quite as effective as caustic applications.

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*Cutaneous Cancer Cured by Roentgen Rays.*

Stenbeck of Stockholm, in *Mittheilungen aus d. Greazgebiete d. Med. u. Chir.*, Bd. VI, No. 3, briefly reports a case of cancroid healed in the above manner. The patient was exhibited before the Swedish Medical Union, and the article is illustrated by photographs. The case is claimed by the author as the first of the kind on record. Patient was a woman.

aged seventy-two years. Two ulcers were present upon the dorsum and right half of the nose. They were roundish and confluent.

The diagnosis of rodent ulcer was made by Professor Berg, and the case referred to the Roentgen Institute.

Daily sessions were begun of ten to twelve minutes' duration, the tube being held fifteen to twenty cm. from the surface. After four sessions the reaction began, and, after eight or ten exposures, profuse suppuration was in evidence, becoming less with time. After thirty-five sessions the ulcers began to look clean and smooth, the epidermal islets were cast off, and new epithelial tissue began to form.

The treatment now became more vigorous, exposures prolonged to fifteen minutes each at only ten cm. distance. A weak reaction appeared, but the new-formed epidermis was not affected, and it was evident that a complete cure had resulted.

The greatest resistance was naturally offered by the hard wall-like circumference of the ulcers. An entire month was required to overcome it. It decreased in height and width, then broke up into individual segments, which in time completely disappeared.

Patient would not consent to have a piece excised for microscopic diagnosis.—*Med. Review of Reviews.*

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## CONSTITUTIONAL DISEASES.

EDITED BY F. H. BISHOP, M. D., WASHINGTON, D. C.

### CAN TUBERCULOSIS BE CURED BY ELECTRICITY?

WHEN seen in the early stages and under favorable conditions it has been the writer's experience that very much constitutionally may be done for consumption. But if the case has advanced to any considerable degree, and the patient is compelled by force of circumstances to remain shut up a better part of the time over a desk, or over sewing or other confining work in an atmosphere impregnated with dust and other irritating particles; as well as living in a humid atmosphere at or near the sea level, with a continuous air pressure from without of about fifteen pounds to the square inch, the conditions are very unfavorable to any form of treatment, and little can be expected except in a change of climate to a higher altitude, where the air pressure will be less upon the chest walls, permitting freer expansion with the least possible effort

to the lungs. Under such circumstances every air vesicle may be filled eighteen or twenty times a minute with air impregnated with ozone.

When the patient's diet, work, and exercise can be controlled by the physician, and too much destruction of lung tissue has not already taken place, the author has been led to believe by the successful treatment of three cases, treated by electrically generated ozone in his static cage, that even in the climate of Washington, D. C., such cases of consumption can be cured by the daily deep breathing of air and ozone in the cage, as generated by the action of static electricity upon the atmosphere. The patient shows improvement first by coughing less; night sweats diminish and finally cease; appetite improves; color and strength gradually return, and the patient will soon volunteer the information that he is improving.

(F. H. B.)

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## DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D., BOSTON, MASS.

*Rational Treatment of Constipation.* By J. R. Leadsworth, M. D., in St. Paul Medical Journal for November.

The local causes, according to Osler, are weakness of the abdominal muscles, as in obesity, improper dress, sedentary habits, and repeated pregnancies; by far the most common cause arising from the atonic condition of the large bowel, particularly the sigmoid flexure by which the faeces are propelled into the rectum. In the normal condition the majority of persons have one stool each day, although many individuals do not consider themselves abnormal in attending to the call once a week.

The most obstinate cases of constipation, not dependent upon structural lesions of the intestines, can generally be relieved by thorough rational treatment. If the patient's habits have been sedentary, he must take abundant exercise by walking, riding, etc. Horseback and bicycle riding are useful in this disease. Another excellent measure in such cases is vigorous kneading and percussion of the abdomen several times a day for eight or ten minutes at a time. Many cases of constipation have been cured by this means alone.

The matter of diet is one of the important considerations in the treatment of constipation. The abundant use of fruit is one of the most excellent means of preventing and curing the disease. One or two oranges before breakfast, a couple of apples at breakfast, the free use of steamed figs, stewed prunes, and other fruits, are means to be recommended in nearly all cases. Some cases are found in which fruit cannot be taken. In these, coarse grains, cracked wheat, oatmeal, graham or bran bread, bran cakes, etc., with such vegetables as string beans, green peas, asparagus and such others as are easy of digestion should be used.

Sinusoidal electricity in the hands of the author has proven very efficacious in the relief of many obstinate cases caused by an atonic condition of the bowels and abdominal muscles.

The following is a history of one of many cases: A mining prospector, who was suffering from chronic constipation, claimed not to have had a natural passage for ten years, often going for seven days before resorting to measures for even temporary relief. He had taken numerous cathartics, and had gone through a long category of patent medicines with no relief. As measures of treatment his diet was corrected, and he was given clysters, abdominal massage, manual and mechanical Swedish movements, gymnastics, and galvanism, but still volitional voidance could not be accomplished, and peristalsis seemed almost absent. Although improvement was apparent, he continued to depend upon the enema. Finally the sinusoidal current was prescribed, being as follows: A large abdominal electrode was applied over the abdomen, the other electrode being introduced well up into the rectum. A slow sinusoidal current to the point of tolerance was allowed to pass for ten minutes daily for three days. On the third day there was a natural movement. The patient was called away on business and did not have the treatment for the three succeeding days. When he returned he reported having had one movement, but was again dependent upon the enema. The second day after renewing treatment the bowels began to act normally, and continued to do so throughout the two weeks' treatment that followed, as they have also since his return home some months ago.

A number of such cases have been treated in the same manner, and the sinusoidal current has been found very efficient as

a means of restoring tonicity to the abdominal and muscular structures. The sinusoidal current has been used with beneficial results, giving tone to the muscular tissue, and is borne more agreeably by the patient.

Many of the patients do not drink enough liquid. A glass of water, on rising and on retiring, often assists in their recovery.

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*Direct Franklinization of the Rectum for Constipation* (from Journal of Am. Medical Association).

Bordier reports the successful cure of several cases of habitual constipation from atony of the intestines by direct franklinization according to Herz, of the rectum itself. He inserts the electrode within the rectum—a brass tube with a spherical tip, insulated at the portion corresponding to the sphincter. The sensation is not painful, resembling a dull shock without heat. The action is more vigorous if the electrode is connected with the outer armature of the Leyden jar at the positive pole of the machine.

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*Electricity in Treatment of Constipation* (from Journal of Am. Medical Association, November 2).

Muco-membranous colitis is a disease which often enough baffles the skill of the physicians who endeavor to cure it by the routine methods of treatment. Dr. Doumer, a Belgian physician, has recently recommended electricity, the continuous current being used as a means of curing the constipation seen in such cases. One patient had suffered from this latter symptom for quite a long period of time, and clinical investigation showed that there was stenosis of the ascending colon. He was subjected to the application of a 10-milliampere current during 10 minutes. The strength of the latter was increased on the following days to 70 and 80 milliamperes, and constipation, as well as all the other morbid symptoms, disappeared completely. Five other patients treated in like manner gave the same gratifying results. The technique of the author is as follows: Two large tampons of carbon, about 6 centimeters in diameter, are covered with chamois skin, dipped in water and placed over each iliac fossa. During the first minute the current is only put up to 30 milliamperes; it is then reversed and increased sometimes to as much as 150 milliamperes. The treatment should be kept up 10 to 12 days. The conclusions of the author are as follows: Such currents are easily and safely administered and can cure long-standing constipation when seen in muco-membranous colitis.

**GENITO-URINARY DISEASES.**

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

BOTTINI'S operation for hypertrophy or enlargement of the prostate has come to the front in the notice of genito-urinary surgery. For more than twenty years Bottini practiced his operation with success, but his modesty did not push his merits. The profession is divided in recognizing the merits of Bottini and his operation, and usually goes to extremes in the reports. Recently the paper of Dr. Orville Horwitz in the Medical News (October 5, 1901, p. 555) deserves particular mention. He gives statistics of 834 cases by 38 operators, of which 36 are his own. He is in favor of the Bottini operation and praises it, as the best radical measure, with a low percentage of failures or fatality. The paper is recommended for perusal and the value of general statistics.

Sexual neurasthenia due to enlarged inflamed prostate has been treated by Dr. W. B. Snow with his new electrode, per rectum, with the static electricity. The electrode will be shown with new instruments in our March number.

He reported the following case at a meeting of the Medical Section of the New York Academy of Medicine on the evening of September 15, 1901. The case will be perused with interest.

E. B. G., aged fifty-seven, salesman; pursuits active, general health good. For about three years the patient had noticed gradually increasing difficulty in micturition, which during the past year had become so pronounced that the urine could be voided only with great effort, frequently, and in small quantities. Patient was compelled to rise from three to four times nightly, and at the time he came to me he was compelled to get up six to eight times. The urine was heavy, clouded, and contained mucus and a few pus cells. I referred him to another physician for diagnosis and special treatment. He returned to me two weeks later no better, and in a state of great mental depression. I diagnosed the case as one of sexual neurasthenia, due to an enlarged and congested prostate gland. On October 3 he was put upon the electro-static treatment. The electrode which we here show was employed, placed well within the rectum, the concave surface over the

convexity of the prostate gland. The wave current was employed—measured by a spark-gap of four to seven inches in length. No administration ever employed by the writer has afforded himself and his patient greater satisfaction. The improvement was immediate and marked. The stream became free and larger, and far less frequent. The urine became clear, and since the third treatment he has not been obliged to rise but once during the night. Patient is rapidly recovering his general health and spirits. The mental depression has disappeared, and he now passes many nights without rising, and never exceeds once. The urine is voided in a large stream and without effort. Two months since treatment the patient has remained well, and neurasthenia has disappeared.

*Electrolysis*, on which we depend so much in genito-urinary surgery, for its chemical decomposition, has been mentioned recently in the literature in different articles.

Dr. F. W. Smith has contributed in the *Lancet* an essay on "Electrolytic Injection." Experiments proved that a therapeutic was driven through the skin at the positive pole, from which it is apparent that the true action was cataphoric, which is a factor of electrolysis. Other articles on electrolytic action have appeared as follows: In *Electricity*, October 23, page 233, by Hubert Schuurman Wynkoop, M. E., on "Electrolysis and Insurance," an abstract from *Insurance Engineering*.

In the *Electric Review*, October 12, page 431, is an article on "Electro-chemical Progress," in which the importance is shown of electrolysis, and its use in our industries.

"Symptoms, Diagnosis, and Treatment of Enlarged Prostate Gland" \* (*American Medicine*, October 26, 1901).

This is a rather lengthy article, describing symptoms, diagnosis, and treatment of the enlarged prostate, comparing the old treatment of catheterization with the radical operation of prostatectomy or Bottini's incision with galvano-cautery. He describes the different steps of the operation with antiseptic precaution, after treatment, and when this operation should be selected. Of late several writers have considered the Bottini operation and the different modifications of the instrument.

The *Medical News* of October 5, 1901, published a paper read by Dr. Orville Horwitz of Philadelphia on "The Pres-

\* By Chas. J. Whallen, M. D., LL. B., Chicago, Ill.

ent Status of the Bottini Operation." The author is in favor of the Bottini operation by the division of the enlarged prostate with galvano-cautery; he gives statistics of 834 cases, of which he operated in 36 cases.

R. N.

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.  
NEW HAVEN, CONN.

*The Aetiology and Treatment of Rheumatoid Arthritis and Allied Affections.* Read by Dr. G. L. Bailey at a meeting of the Academy of Medicine of Cincinnati held May 6, and reported in the Cincinnati Lancet-Clinic for July 13.

The use of hot air was referred to as follows:

As a rapid means of arresting the disease, relieving pain and swelling of the joints and increasing the power of atrophied muscles, the writer has used the hot-air bath, followed by massage, to great advantage. The patient is placed in a special apparatus, on an asbestos mattress, and the whole body except the head subjected to a temperature of from 220° F. to 280° F. for about forty-five minutes. This heat is conveyed to the body by currents of dry superheated air, which rapidly induce perspiration and exercise the well-known alterative action of heat on the diseased joints. During the treatment iced cloths are kept on the patient's head to prevent the feeling of fullness which otherwise is experienced, and he is encouraged to drink freely of cool water to promote diaphoresis. The sweat, from being acid or neutral, becomes alkaline, with increased specific gravity. At the end of the treatment the respiration and the heart action are increased in frequency and the temperature, per os, is usually raised from two degrees to six degrees above the normal. Patients express themselves as feeling no inconvenience or painful sensations while subjected to these temperatures, and after a brisk massage and a rubbing with alcohol usually feel exhilarated. The relief from pain is, in some cases, almost immediate; in others two or three treatments were given before relief from pain was afforded. In three of the twelve cases treated pain was increased after the third or fourth treatment, but this subsequently subsided, and relief followed. In only two of the twelve cases was no improvement noted, one of these a strumous young woman in whom bony ankylosis had set in, and in whom there was a doubt as to the diagnosis; the other a sprained wrist complicated by rheumatoid arthritis in which treatment was discontinued after five treatments. The cases ranged in severity from Heberden's nodosities involving a single finger of one hand to the

general progressive form involving all the joints. Similarly good results were obtained in cases of chronic articular rheumatism, and muscular rheumatism yielded with great rapidity and certainty in very few treatments; most cases being almost entirely free from pain after one treatment.

At present sufficient time has not elapsed to demonstrate the permanence of these improvements, but any means of relief to sufferers from rheumatoid arthritis is a great boon, no matter how short the time. Of the twelve cases treated, averaging eleven treatments each, the disease was apparently arrested in nine for a period of three months or more; one showed a return in two months, and is now under treatment; and two showed no improvement. Fifteen cases of chronic rheumatism (articular) treated by this method, averaging nine treatments each, show three to have been apparently cured after three months or longer; six improved enough to resume their ordinary work, but still feeling occasional effects of the disease; three showed only temporary improvement, two of whom stopped treatment; and three cases showed no change whatever.

Six cases of muscular rheumatism resumed their customary employment after an average of two treatments, and no return of the disorder has been reported, after a lapse of a month or longer.

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*Lupus Treated by Hot Air (Journal of Physical Therapeutics).*

Four cases of lupus are reported by Werther (Munch. Med. Woch.) to have been treated by Hollander's hot-air method, which consists in the application of hot air up to a temperature of 300°. The action of hot air can be better concentrated on the affected part than steam. Of the four cases so treated three healed with good scars, and one relapsed. The treatment takes three or four weeks, and is especially recommended in lupus of the eyelids. A general anæsthetic is necessary.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

*Discovery of Early Tuberculosis by the X-Ray.*

Dr. J. E. Stubbert, in the Post-Graduate for November, spoke emphatically of the value of the X-ray in the early diagnosis of phthisis. He said: We must have density to produce a shadow, but we can go farther and say that a density that produces a slight shadow will not always give physical signs sufficiently definite to justify a diagnosis. The same

remark applies much more emphatically to a haze seen at the apex than to a light shadow. While I have never seen a haze in which there could not subsequently be recognized in that area physical signs of tuberculosis, we do occasionally meet such cases which, at the time of the first examination, do not show any physical signs whatever. I remember a case which came before one of the best diagnosticians of New York City, and also before me, without either one of us being able to make a positive diagnosis. There were some physical signs which led us both to believe the patient to be in the prebacillary stage of tuberculosis. I then examined the patient with the fluoroscope and discovered a decided haze at one apex, where the indefinite physical signs were present. This haze could not have been thrown by any other than a tubercular condition, and subsequent events fully justified a positive diagnosis of tubercular infiltration.

In such doubtful cases it is better not to depend entirely upon the eye or the picture seen upon the screen, but to use, in addition, a metal rod placed between the screen and the patient's body across both apices. If the outlines of the rod are less sharply defined and its color less black upon one side, even though you may not be able to trace with the eye the outlines of a decided haze, you may be sure that the beginning of infiltration is present. Again, in some of these very incipient cases, the edges of the clavicle upon the affected side appear a little ragged, and the bone itself does not stand out quite so prominently. Patients showing these signs on the fluoroscope, even with indefinite physical signs but some constitutional symptoms, should be kept under very close observation and, possibly, be placed upon treatment.

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*The Diagnosis of Stone in the Bladder, Kidney, and Ureter by the X-ray.* By D. J. Hayes, M. D., in the Medical Age for October.

He says "that the successful use of the X-ray has done away with the necessity of a diagnostic incision for renal and urethral calculus with its risks." In connection with the paper he publishes three radiographs which show remarkably good results. No comments are given concerning the technique of their production, the writer's object having been to show the value of the X-ray in diagnosis. One was taken at the Milwaukee X-Ray Laboratory, and the other two by W. C. Fuchs of Chicago.

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*Differential Diagnosis between Inflammatory Processes and Neoplasms.*

Dr. Carl Beck's article, in the December number of Annals of Surgery, contains skiagraphs of an excellent order,



HISTORY OF SKIAGRAPH.

CLARENCE E. SKINNER, M. D., LL. D., New Haven, Conn.

Two years ago a needle was broken off in the finger, but was supposed to have been entirely removed. Pain had been present at intervals during that time, but had become very harassing for a month previous to consultation. The surgeon consulted, Dr. Arthur S. Cheney of New Haven, Conn., suspected from the history that some of the needle was in the finger, but the patient refused to allow him to cut for it without positive evidence, and he sent her to me for X-ray examination.

The result is shown in the skiagraph, where the fragment of needle appears opposite the junction of the distal and middle thirds of the terminal phalanx of the middle finger.

*Tube.*—Monell type, 4-inch spark resistance.

*Distance* between anode and cathode, about  $3\frac{1}{2}$  inches.

*Exciter.*—Van Houten & Ten Broeck twelve 32-inch plate static machine.

*Distance* of plate from anti-cathode, 15 inches.

*Time of exposure,* 10 seconds.

*Plate.*—Seed's X-ray.

*Developer.*—Ordinary pyro.

*Paper.*—Aristo, jr.

**HISTORY OF SKIAGRAPH.**

Showing congestion of the carpus, the site of local tuberculosis.

*Tube.*—Monell type, 1-inch spark resistance.

*Distance between anode and cathode,* about  $3\frac{1}{4}$  inches.

*Exciter.*—Ten 30-inch plate static machine.

*Distance of plate from anti-cathode,* 18 inches.

*Time of exposure,*  $2\frac{1}{2}$  minutes.

*Plate.*—Fresh Carbuts X-ray plate.

*Developer,* pyro-soda.

which ably illustrate a point he forcibly brings out—he says: “Many limbs have been sacrificed by unnecessary amputation and many lives lost by deferred amputation on account of errors in differentiating the various inflammatory processes from the growths of the bones and joints. The Roentgen rays have opened entirely new fields in this sphere. If they cannot always give a positive answer, they often, by the method of exclusion, increase the chance of arriving at a correct diagnosis.

“If in a case of an obscure swelling of the knee-joint, for instance, the Roentgen rays reveal no impairment of the integrity of the joint, osteitis, tuberculosis, syphilis, or a bone injury can be excluded. It is certain, then, that only the soft tissues are involved. Thus we may, in conjunction with other clinical symptoms, be satisfied that we have to deal with a rheumatic swelling, for instance. But in many instances the Roentgen rays give a positive information.

“Again, in periostitis as well as in osteomyelitis the skiagraphic signs are well marked. Abscesses cannot only be localized, but their extent is also so well outlined that the technical steps of the operation can be definitely traced in advance. The feeling of security the surgeon has while proceeding under the mentorship of the skiograph gives a satisfaction unknown in former years, when often the whole femur, for instance, has had to be exposed simply in order to ascertain whether all foci were detected. If the Roentgen rays show but one focus, no other regions of the bone need to be attacked.

“In such cases a preceding trauma often opens the avenue of infection. The pain, the oedema, the fever, and general debility may be sometimes so little marked that differentiation becomes difficult. The skiograph not only clears this difficulty of diagnostinating this disease, the true aetiology of which is still so obscure, but also furnishes a trustworthy guide for the operative technique.

“It may be said that in aneurism the bone would show intact. At a meeting of the surgical section of the New York Academy of Medicine, January 9, 1899, I had an opportunity to call attention to the usefulness of the Roentgen rays in a case of femoral aneurism which, on account of its extremely thick walls, showed no pulsation; so that it had originally been taken for osteosarcoma, an amputation then having been considered. (See ‘On the Difficulty of Differentiating between Femoral Aneurism and Osteosarcoma,’ International Clinics, vol. iv, Ninth Series.) The femur appearing intact, it was evident that there was a disease of the soft tissues.”

He finally remarks: “The skiagraphic characteristics described are not expected to serve as substitutes for our well-tested clinical methods of diagnosis, but should be regarded as

valuable adjuncts in general, and sometimes as determining factors in doubtful cases."

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## HYDROTHERAPY.

### *Hydrotherapy in Tuberculosis.*

In the discussion of a paper by Dr. Weber before the Post-Graduate Clinical Society, published in the Post-Graduate for November, Dr. Simon Baruch said of the treatment of tuberculosis:

Physio-therapy has revolutionized the treatment of these cases. This method, of course, includes climate, rest or exercise, diet, bathing and feeding. Until we obtain an anti-toxin which will destroy the tubercle bacillus, we must endeavor to do the next best thing, viz., enhance the resisting capacity of the patient. In the scheme of treatment devised for this purpose, hydrotherapy has, in my humble opinion, been of the utmost advantage. I regret to say this is not generally recognized. One of the reasons for the neglect of a valuable agent is, that it is not usually prescribed with sufficient precision. You have heard, even to-night, remarks upon tepid baths and cold baths, and sponging, packs and douches, without any statement of the temperature, without a statement of the duration, without a statement of the pressure. All of these things I have tried to emphasize and impress upon my colleagues for several years, because experience has shown me the necessity of doing so. In other words, I endeavor to use water as I do any other remedial agent, namely, by prescribing it with the same exactness and insisting on its systematic application. The latter is even more important in using water because it is more flexible than medicinal agents, by reason of considerable ranges in temperature, pressure, and duration of each procedure. The same thing may be said of the effects of climate in phthisis. We have climates ranging from the low altitude of the Riviera to the high altitude of Colorado, from the balmy atmosphere of Madeira and Florida to the frosty air of snow-capped Davos and the Adirondacks. We get good results from these varying climates, varying altitudes and temperatures in all cases where intelligence and good judgment are used in prescribing them. This is the case with regard to hydrotherapy also. Whenever water is applied with skill, precision, and cautious adaptation to each individual case, then, and then only, will we get adequate and favorable results.

What is our therapeutic mission in tuberculosis? To enhance the vitality, to arouse the resisting capacity of the patient, and render the organism immune to the onslaughts of the bacillus. Exercise is a much-valued element of bringing

about these results. But in acute cases, which must be confined to bed, exercise is out of the question. Here cold water comes into play as a substitute. It is the great physiological tonic, and has exactly the same effects. Cold water will improve the digestion and assimilation, just as exercise does; cold water will enhance constructive metamorphosis, even better than exercise, because it does not increase destructive metamorphosis, and it may be supplied in febrile cases in conjunction with exercise and other measures. You can apply cold water for these purposes with the most satisfactory result, if you bear in mind the physiological action of water in health. As you know, cold and heat are a stimulus to the cutaneous sensory terminals, from which the effect is conveyed to the central nervous system, and from this reflected up in the blood, making the respiratory, circulatory, and excretory organs. This is the whole thing in a nutshell, this the basis of all you need to know about hydrotherapy. This is the end and aim of every cold application and every hot application. What is the effect when you apply cold water to a fainting woman? The stimulation of the sensory cutaneous terminals conveyed to the brain and reflected through the vagus, causing deep inspiration and improvement of cardiac action. It does restore, better than anything else that I know of, the lost equilibrium of the fainting woman. It has an immediate effect, which no other stimulant can produce. You see the reason for its having that effect when you reflect upon the rationale of its action in the light of your physiological knowledge.

What is to be done in acute cases? The patient is put to bed, we direct good nursing, diet, and baths. We have learned from Dettweiller and Breckmer and Roempler to apply water with the same exactness as diet, rest, exercise, sleep are regulated. Apply cold water always with a view to bringing on a gentle reaction. When you have fever, you want a gentle reaction. In phthisis never apply water all over the body at once, because the patient is not in a condition to make the response which you demand by pouring cold water all over the skin, or dipping the body into a cold bath. He can respond to the washing of the chest or trunk, or part of the body—but he cannot always respond to cold ablution or a bath of the whole body. Wash him, do not sponge him, with a bath-glove, using gentle friction, which, by mechanical stimulation, counteracts chilling. Take a basin of water at 90°, put the patient to one side of the bed, place a blanket and linen sheet under him. Begin with the naked hand dipped into the water and rub him on successive parts of the body. You want a simple impact, and you want a response from that impact. If there is a response shown by the patient's comfort, take water at 88 or 86°, and wash him off rapidly with a bathing-glove, using gentle friction. At each application reduce the

temperature of the water. If the body temperature is  $102^{\circ}$  or over, I would make the application every two or three hours. He must produce his own reaction, for the fact that he reacts from these cold washings demonstrates that his skin is getting a neuro-vascular training which refreshes him. That is a word I have coined, for it gives an idea of the rationale. Wash the trunk and limbs only as far as the knees and elbows, never below, for these parts do not react very well, as you know. After you find that the patient is getting accustomed to this treatment, increase the quantity of water and dash it upon the successive parts. The water temperature may be reduced from  $90^{\circ}$  until  $70^{\circ}$  are reached. If the temperature is  $104^{\circ}$  or  $105^{\circ}$ , I am in the habit of using a chest compress—using linen cloth, for that takes up the water well while cotton cloth does not, therefore linen is the proper material for the compress. Make a compress of three or more pieces of old linen, wring this out of water at  $70^{\circ}$ , and reduce it every two or three hours, until  $60^{\circ}$  F. are reached. This is wrapped around the thorax and covered with one layer of flannel, snugly pinned. The flexibility of this treatment is illustrated by the fact that it may be changed according to indications, as follows: If I want to get an anti-pyretic effect, I do not wring out so much water, because, by leaving the cloth well saturated with cold water, I am enveloping the patient in a partial cold bath. Here we have a continuous effect from action of the cold and the reaction; first a gentle surprise to the cutaneous vessels and nerves, then a reaction—a warming up of the parts. The flannel covering of the wet compress or chest bandage makes it a poultice, which is soothing. If the temperature is very high, say  $105^{\circ}$ , and the patient is very restless, never use very cold water—do not use it below  $70^{\circ}$ , because you are then making a demand upon the feeble organism of the patient which he cannot respond to; and if he should respond to it it would exhaust him; while it will refresh him it will not reduce the water temperature too low. Here let me say what few will credit me with believing. Cold water is about the poorest anti-pyretic I know of. You may with ten grains of antipyrin reduce a temperature of  $105^{\circ}$  to  $102^{\circ}$ , but you cannot do this with any form of cold water. I never use it as an anti-pyretic, although I am regarded as an enthusiast in the coldbath treatment of fevers. Cold water should be used to stimulate the nervous system, to refresh it, and thus improve the patient's resisting power. In my lectures you will probably hear me repeat this idea over and over again, for if you master the one idea you will become less afraid of it and utilize it more. Never chill your patient, but bear in mind that you must produce reaction, which is manifested by some reddening of the skin, or at least a feeling of warmth, not coldness.

## THERAPEUTIC EXERCISES.

### *A Note on the Treatment of the Ataxia of Tabes by Means of Co-ordinate Exercises.*

In the Edinburgh Medical Journal for September, 1901, Bramwell gives the following directions abstracted from the Therapeutic Gazette:

Exercises for the Lower Limbs (while in Bed).—The patient lies on his back in bed and slowly raises his extended leg until he touches with his great toe the finger of the attendant, held immediately above his foot, at a distance of eighteen inches to two feet from the bed. This exercise should be repeated several times with either leg.

Still lying on his back, he flexes his leg on the thigh to its full extent, and then slowly flexes the thigh on the abdomen; the whole limb is then gradually extended until he touches with his great toe the finger of the attendant, which is held in the same position as in the previous exercise. The limb is then slowly lowered to the bed.

For the next exercise a simple piece of apparatus is necessary, namely, two boards three and one-half feet long and nine inches in breadth. One long edge of board A is attached along the middle of B, so that, looked at from the end, the extremities of the board form the letter T, the limbs of the T corresponding to the breadth of the boards, namely, nine inches. The apparatus is placed across the foot of the bed, resting on board B. Along the unattached edge of board A are six grooves 1 1-2 inches deep, 3 inches in width, and at a distance of 3 inches from each other.

The patient lies on his back with his heels resting in two of these grooves; at the word of command he lifts one heel from the groove in which it lies, and places it accurately in the groove named by the attendant. For this purpose it is convenient to have the grooves numbered; they, too, should be well padded.

Standing Exercises.—A very ataxic patient, who has been long confined to bed, has forgotten how to stand, and when helped out of bed his legs slide away from under him. His feet are to be placed in position, and with someone supporting him on either side, he is to be encouraged to practice his balancing power, gradually putting more and more weight upon his legs. He is to practice standing with his feet close together, lifting one foot off the ground and placing it down again accurately.

Other and more difficult exercises are the following: Standing with eyes closed and feet close together, standing on tiptoe, standing on one foot with closed eyes, etc. Sudden giving way of the legs is a symptom which may prove troublesome

when an ataxic patient first begins to stand and walk. Even where there is not a high degree of ataxia, this symptom is sometimes present. The writer has found that the support which may be obtained by bandaging the knees firmly is of value in such cases.

**Walking Exercises.**—A black stripe twelve inches broad is painted across the floor of a room or on a piece of wax-cloth. The patient walks along this stripe, either with support or in the go-cart, taking care to keep his feet within its margins. He may walk with bare feet or with his boots on; the former he will probably find the more difficult. Having mastered this exercise, he practices walking along a similar stripe, on which at distances of one foot cross lines are painted. This is more difficult than the last exercises, for here he has not only to keep his feet within the limits of the black stripe, but whenever he takes a step the toe must be placed down exactly at the cross line. This exercise is very important, since by teaching the patient to take steps of regular length it necessarily greatly simplifies the co-ordination required in the act of walking.

When the patient has acquired skill in the exercises already described, he proceeds with similar exercises upon a narrower stripe (six inches in breadth); as he is now obliged to walk a "narrower base," this exercise is more difficult than the last mentioned.

The patient is to practice walking sideways along these stripes, and turning round within a circle of small radius. Having attained proficiency in the above, he may attempt the same exercise on tiptoe or with bent knees.

According to the degree of ataxia, support may or may not be necessary in carrying out all these exercises.

As soon as the patient has learned to walk on level ground fairly steadily and confidently, he may be taught to walk up and down stairs. In a hospital, where cases of tabes are constantly being treated, a specially constructed staircase of several steps, three or four feet in breadth, will be found of value. With a rail in each hand the patient sooner acquires confidence, and makes more rapid improvement than on an ordinary staircase. In a private house, where such a staircase is not available, he will probably at first require the support of his arm while he holds the banister in his other hand. Each step has to be taken just as carefully as when he walks on level ground. A tabetic is not uncommonly to be seen going upstairs in the following fashion: he raises the foot and puts it down on the next step correctly; then, instead of taking the step by contracting his quadriceps, he straightens the leg, and, using it as a lever, pulls himself up by the aid of his hands. He has forgotten how to use the legs when going upstairs, and until his error is pointed out he will make no progress.

Such exercises as piling draughts one upon the top of an-

other, placing marbles of different size into the numbered cups of a solitaire board, drawing patterns and figures, connecting with a pencil points marked out on a large sheet of paper, etc., will be found to be of use for the upper limbs.

The length of time daily which should be given to the exercises must depend on the individual case. A quarter of an hour, two or three times a day, will probably be sufficient at first. In less severe cases more time may be given to practice. After each exercise the patient should take a short rest. An exercise must be stopped on the earliest appearance of fatigue, or if there are any signs of the patient's attention beginning to wander.

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*Physical Culture in School Children* (the British Medical Journal, September 21, 1901).

Sir John Gorst, in "his presidential address to the Section of Educational Science of the British Association," and Dr. J. Madison Taylor, at the June meeting of the American Medical Association, advocated physical education for school children.

Dr. Taylor argued that medical supervision should be given to children, particularly during growth. Faulty attitudes from faulty physique, inheritance, or imitation, defects of the eye, ear, and nasopharynx required correction. The breathing capacity should be increased in many instances. Errors in teaching should be avoided. In sitting keep the back straight, and the shoulders absolutely free. Proper training would correct stooping shoulders, sunken chests, drooping heads, lowered right shoulder, tilted pelvis, pigeon toes, and spinal curvatures.

Dr. Darnall advocated outdoor life during puberty, as hysteria, crossness, irritability, and neurasthenia should be guarded against.

Dr. Learned spoke against early school life, placing the minimum age at eight years.

"Dr. Leigh Baker said it was the duty of physicians to unite and place the right kind of men on school boards. A medical man should be at the head of the department of school hygiene, and he should be at the same time a school sanitarian."

A. S.

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## DIETETICS.

*Diet in the Treatment of Tuberculosis.* By Professor Max Einhorn, M. D., in the Postgraduate for November.

"The Home Treatment of Tuberculosis" is a very important one, and I take the opportunity of saying a few words.

with regard to the great value of the dietetic management of this disease. In the early stages of tuberculosis the principal symptoms which torment the patient are often those referring to the digestive tract—anorexia, fullness after meals, eructations, pains in the stomach and entire abdomen, constipation, diarrhea, or the occurrence of these two conditions alternating, sometimes nausea and even vomiting.

The digestive disturbances have usually, as a consequence, the partaking of too small a quantity of food. This insufficient nutrition reduces the patient in his weight and strength so that symptoms of inanition may be present and thus weaken the organism in its battle against the tuberculous disease. The value of feeding the patient well—that means giving him a sufficient quantity of food or rather more nourishment than necessary—is evident. In my book "On Diseases of the Stomach" I wrote in 1896 the following item: "It will be seen that frequently the subjective symptoms do not harmonize with the objective data found in a thorough examination of the stomach. The point to be gained from this fact with regard to treatment is not to be afraid of giving sufficient food to these patients with markedly disturbed appetite and many other dyspeptic symptoms. In fact, lavage or forced alimentation will often prove very useful. Debove, Peiper, Leyden, and others have obtained the most beneficial results in phthisical patients by this method."

In a discussion on a similar subject at one of the meetings of the County Medical Association a few years ago I took the opportunity of enhancing the great importance of feeding the tuberculous patients liberally, and laid stress especially on the great use of the addition of considerable quantities of butter to their nourishment. Just like in other instances, where it is important to attain an increase in weight, so here the butter—about one-quarter pound daily, given with bread and cereals, when the patient is taking an ordinary amount of food besides—is very helpful. Practically, in most cases, the diet can be arranged in the following way:

7.30 a. m., Breakfast.—Two eggs, toasted bread and butter, coffee, with half milk, sugar and cream.

10 a. m.—A glassful of milk or kumyiss, bread and butter.

12.30, lunch.—Meat (steak, chicken, and the like), mashed or baked potatoes, white bread and butter, cup of coffee, with milk and sugar.

4 p. m.—The same as at 10 a. m.

7 p. m.—Meat-soup, with a little rice or farina in it; meat, mashed potatoes, rice or green peas, or any other light vegetable, bread and butter.

10 p. m.—Oysters, crackers and butter, a glassful of ale or stout.

Certainly the diet is subject to modifications, as, for in-

stance, if there is diarrhea and the like. The diet should be carried through, no matter whether there is appetite or not. If the patient will be imbued with the importance of this kind of alimentation he will be made to manage it.

Plenty of fresh air and an out-of-door life is certainly of importance, not only in giving the patient a greater amount of purified air and oxygen, but also in increasing his appetite and the digestive faculty. Whenever it is possible to have a patient in the best climatic surroundings and provided with the facilities of a good, wholesome cuisine the treatment will be crowned with the best results. When, however, it is impossible to have the two factors together, and when we have to choose between a place where the right kind of nourishment can be given and a place where the climatic conditions are most favorable, I think that it would be rather more advantageous for the patient to stay at home and take his good nourishment than to leave his place for high altitudes without the proper foods.

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*"Diet Treatment of Obesity."* By J. Warren Achorn, M. D.  
Abstract from the Dietetic and Hygienic Gazette, November, 1900.

The causes of obesity are overfeeding, an ill-balanced diet, "race, heredity, laziness or a lazy liver, occupation and exercise, a small heart and lungs, mental peculiarities and temperament, small brains, age, sex, and the frying pan." Fat people frequently show how little they eat, but the truth is they eat that little often or deceive themselves.

Do not tell a patient the cause of his obesity, for he is liable to reconcile himself to the situation and do nothing for himself. "Inherited tendencies are a congenital defect, present in fifty per cent. of all cases." Begin in childhood to treat obesity under such conditions.

Stoutness is oftener due "to the intake" than "to the outgo" late in life, although it may occur from under feeding when the patient is pale and flabby. Those people who "can live on half as much as others and be fed" should "limit their food to their needs." Reaccumulation of fat or inability to reduce it is quite frequently due to lack of will force. "One can learn to like one or two at least of the foods suited to their use, in six weeks' time, if they will let the foods denied them religiously alone."

**BOOK REVIEWS.**

**CONSERVATIVE GYNECOLOGY AND ELECTRO-THERAPEUTICS.** By G. Betton Massey, M. D., Physician of the Gynecological Department of Howard Hospital, Ex-President and Fellow of the American Electro-Therapeutic Association, etc., etc., Illustrated with twelve original full-page chromo-lithographic plates and twelve full-size half-tone plates of photographs taken from nature, and numerous engravings in the text. 400 pp. Price —. F. A. Davis Co., Philadelphia, Pa.

In this elegant work the author has set forth, in a clear and practical manner, not only the technical methods of electro-therapeutic application, but the other measures so often valuable in the conservative treatment of woman's diseases.

No modern work on gynecology is more practical and safe in its directions, or humane in its methods. The physician who literally follows the technique of Dr. Massey will obtain results that will be most gratifying. Those who fail will do so because they have erred in diagnosis, or carelessly used an agent which requires the proper technique, which any capable physician can acquire with application. This work ably considers a great middle ground between the simple measures and heroic gynecology. The book should be in the hands of every general practitioner, and the gynecologists as well.

**THE PHYSICIAN'S VISITING LIST** for 1902. (Fifty-first year.) Price, in leather cover with pocket and pencil, \$1.00. P. Blackiston's Son & Co., 1012 Walnut St., Philadelphia, Pa.

It is one of the most practical and convenient books of the kind on the market, containing as it does many useful suggestions, blank leaves for special entries, appointments, obstetrical engagements, etc. Sold by all booksellers and druggists.

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**SOCIETY MEETING.****REPORT OF ELEVENTH ANNUAL MEETING OF  
THE AMERICAN ELECTRO-THERAPEUTIC AS-  
SOCIATION (CONTINUED).\***

SECOND DAY—WEDNESDAY, SEPTEMBER 25.

The meeting was called to order by the president at 10 a. m. The Committee on Arrangements made an announcement.

On motion of Dr. C. R. Dickson of Toronto the reading of the minutes of the previous session was dispensed with.

Dr. C. R. Dickson then read the report of the Special Committee as to Priority in Production and Use of the Static Induced Current.

\* Held in Buffalo, N. Y., September 24, 25, and 26, 1901.

Dr. C. R. Dickson then moved that this report be adopted and be placed on record at the earliest possible date, and that it be exempt from the usual rule, i. e., that papers shall appear exclusively in *Electro-Therapeutics*, and that permission be given to all journals which so desire to publish this report. He also moved that the hearty thanks of the Association be extended to Mr. Jenks and his associates, for the labor they had bestowed on the preparation of this report. Dr. Massey seconded these motions, and they were carried unanimously.

The following were elected to membership in the Association by separate ballots, cast by the secretary under instructions from the Association: Drs. F. S. Towle, Clarence D. Skinner, LL. D.; F. H. Pease, Andrew H. Allen, D. R. Kinsell, Jr.; P. L. Hilsman, F. G. Du Bose, Lucy Hall-Brown, Francis H. Scratchley, M. F. Wheatland, and Mary A. Nutting.

On motion of Dr. C. R. Dickson, Professor Samuel Sheldon was elected to honorary membership.

The president appointed the following to serve on the Committee on Nominations: Drs. R. J. Nunn, C. R. Dickson, F. B. Bishop.

The following were appointed as an Auditing Committee: Drs. W. H. White and John Gerin.

At the request of Dr. Gerin, Dr. Snow explained his plans for carrying on the new electro-therapeutic journal.

The executive session adjourned at 10.50 a. m., and the regular scientific programme was taken up.

At the request of Dr. S. F. Wilson of Montreal his paper, "On the Modus Operandi of Interpolar Currents as Therapeutical Agents, with Special Reference to the Static Machine," was read by title.

Dr. S. F. Wilson then exhibited a Transformer, and read a description of it furnished to him by the makers.

Discussion by Dr. W. H. White, and the discussion was closed by Dr. Wilson.

Dr. William B. Snow of New York read a paper on the "Effects of Electro-Static Modalities upon Hyperæmia and Pain." The paper was discussed by Drs. Morton, O. S. Phelps, F. B. Bishop, J. D. Gibson of Birmingham, Ala.; Massey, C. O. Files of Portland, Me.; S. F. Wilson, and the discussion was closed by Dr. Snow.

Dr. Robert Newman of New York read a paper entitled

"Morton's Wave Currents of the Static Machine and Werber's Insulator." Discussion by Dr. Morton, Dr. Snow, Dr. Waite, Dr. Alfred T. Livingston of Jamestown, N. Y., and Dr. Werber.

Dr. W. B. Snow read by title a paper on "Methods in Radiography."

Dr. J. D. Gibson of Birmingham, Ala., read a paper on "Ozone in Tuberculosis," which was discussed by Drs. Files and Morton.

Adjourned at 1.15 p. m.

The evening session was held at the Pan-American Exposition in the New York State Building, and was called to order of the president at 8.15 p. m.

Mr. Henry Rustin, Chief of the Mechanical and Electrical Bureau of the Pan-American Exposition, read a paper on the "Electric Lighting of the Exposition." At the close of his paper, Mr. Rustin made some additional remarks on the mode of building up the lights every night. The paper was discussed by Drs. Morton, Gibson, Massey, Reyburn, and A. T. Livingston.

On motion of Dr. Gerin, seconded by Dr. Reyburn, the Association tendered a vote of thanks to Superintendent Rustin for his valuable and very instructive paper.

Dr. Frederic H. Morse of Melrose, Mass., read a paper on "The Electrical Treatment of Neuritis." It was discussed by Drs. Morton, Massey, Snow, F. H. Bishop, John Gerin of Auburn, T. F. Pease, J. D. Gibson, and Josephine Davis of New York, and the discussion was closed by Dr. Morse.

Dr. S. W. Bayliss of Buffalo read a paper entitled, "Why I Use Electricity in General Practice," and illustrated his remarks with lantern views. The chief topic considered was X-ray photography.

Dr. L. A. Weigel of Rochester read a paper on "The Cause and Prevention of Common Errors in Radiography." Discussed by Dr. Snow, with closing remarks by Dr. Weigel.

On motion of Dr. J. D. Gibson, the Association tendered a special vote of thanks to Dr. Weigel for his excellent paper.

Adjourned at 10.30 p. m.

## PROBLEMS IN ADVANCED THERAPEUTICS.

The editor will see that inquiries of general interest are answered in this department. Others will be answered by letters. We direct attention to the following rules.

- I. Each inquiry must be accompanied by the name of the writer.
- II. The question must be pertinent to the subjects treated in this journal.

### *Which Pole in Iodine Cataphoresis.*

In answer to the inquiry published in the last issue Dr. Marcus Wheatland sends the following:

To the Editor Advanced Therapeutics:

Since the last meeting of the American Electro-Therapeutic Association I have made the following experiments with iodine and iodide of potash, in order to satisfy myself as to the correct pole to be used in the administration of these remedies by cataphoresis. In doing this work electrodes of platinum were used; the active pole was covered or connected with cotton saturated with the solution under examination. Beef was first used, but, as it was difficult to get the reaction to starch, when I had reasons to believe that the tissues around the electrode contained iodine in some form, I used a vegetable substance—stems of a begonia—which, on account of its watery constitution, is a good conductor, and by its softness I was enabled without difficulty to remove small pieces from time to time and test them for iodine.

Experiment No. 1.—Sol. KI., neg. pole, 50 ma., 20 m. Results: Cotton uncolored; no reaction to starch when meat was cut and test applied.

Experiment No. 2—Sol KI., pos. pole, 50 ma., 20 m. Results: Cotton turns dark; reaction to starch around the site of the electrode; no apparent penetration of tissue. The poles were now changed (the electrodes remaining in position), the current turned on, and in about thirty minutes the cotton turns white. No iodine was seen when the pole was again made positive and inserted into another portion of the meat.

Experiment No. 3.—Lugol's solution, pos. pole, 50 ma., 20 m. Results: Cotton remains dark; no evidence of penetration.

Experiment No. 4.—Lugol's sol., neg. pole, 50 ma., 20 m. Results: Cotton turns white; apparent penetration of tissue. Instrument removed and inserted into another portion of the meat, poles changed, and current turned on as before; color does not return to cotton, showing that all the iodine had been withdrawn from the cotton.

In using the stem of the begonia a platinum wire was inserted into one end of it, and the other was covered with cotton saturated with the solution and connected with a platinum electrode.

Experiment No. 5.—Sol. KI., neg pole, 20 ma., 30 m. Re-

sults: Cotton remains white; no iodine could be detected along the course of the current.

Experiment No. 6.—Sol. KI., pos pole, 20 ma., 30 m. Results: Cotton turns black; poles changed, cotton turns white, color of stem changes. A few cells removed readily reacted to starch.

Experiment No. 7.—Lugol's sol., pos pole, 20 ma., 30 m. Results: Iodine remained at positive pole; no evidence of penetration along the stem; no reaction to starch.

Experiment No. 8.—Lugol's sol., neg pole, 20 ma., 30 m. Results: Unmistakable evidence of iodine. Small pieces of stem removed readily reacted to starch. The morning after this experiment the stem looked like a large lump of iodine.

From the above I feel warranted in coming to the following conclusions, that

- (1) The positive pole decomposes iodide of potash.
- (2) The negative pole does not.
- (3) In order to diffuse iodine from an iodide into the tissues you must first liberate the iodine with the positive pole; then reverse the current. Iodine, being electro-negative, will be diffused into the tissues on its way to the positive pole.
- (4) When the positive pole alone is used with iodide of potash, only the topical action of iodine is obtained.
- (5) When the negative pole is used with iodide of potash (and we may say any iodide) the good effects which follow its use are due to the electric current alone, and not to the iodine diffused.
- (6) The best solution to use, when it is desired to diffuse iodine into the tissues, is one containing free iodine such as Lugol's (Liq. Iodi Compositus).

MARCUS F. WHEATLAND.

Newport, R. I., December 28, 1901.

## NEW AND IMPROVED APPARATUS.

This department is devoted to publishing, with illustrations, drawings, and descriptions, new apparatus, electrodes, etc., for the benefit of those interested in the progressive improvements in armamentaria.

### *An X-Ray Stereoscope.*

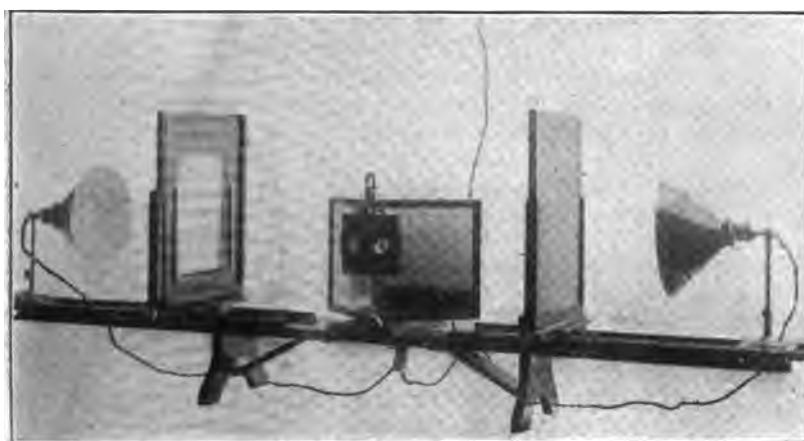
An X-ray stereoscope, designed by Dr. L. A. Weigel of Rochester, N. Y., and described by him in the New York Medical Journal of November 16, is an instrument of more than ordinary merit and value. It is shown in the accompanying cut.

Its use is described by Dr. Weigel as follows:

The correct interpretation of X-ray negatives frequently presents considerable difficulty, because all parts of an object

lying in different planes are projected into one, and there is practically no way of showing the superposition of the various planes and the distance which separates them. This defect of the ordinary skiagraph is readily overcome by making two stereoscopic negatives, which, when placed in the stereoscope, virtually reconstitute the object in space. Every detail of the negative is seen in its proper place, the surfaces appear in their natural form, and the various planes are correctly separated from each other.

The stereoscope shown is adapted for studying the original negative, although it may also be used for examining full-sized prints. It is constructed on the principle of the reflecting stereoscope invented by Professor Wheatstone in 1838.



In this apparatus two plane pictures, representing slightly different views of an object, are superimposed and appear to the eye as giving the same relief as the object itself.

As seen in the illustration, it consists of a bed-piece upon which, at its center, two mirrors, inclined to each other at an angle of  $90^{\circ}$ , are mounted on a slide having a forward and backward movement, to facilitate adjustment. At the angle formed by the mirrors a screen, with openings for the eyes, is placed.

Two grooved frames for holding the negatives face the mirrors and are adjustable by a simple sliding motion in two directions—one at right angles to the base, and the other parallel with it. In the base of the frames there is also a mechanism controlled by a milled-head screw, for vertical adjustment. By means of these various movements the image of the two negatives reflected in the mirrors may be quickly adjusted until they are accurately superimposed, and stereoscopic relief is obtained.

Transillumination of the negatives is necessary, and this is best secured by artificial light. The most convenient and satisfactory source of illumination is from an electric light. In my apparatus a sixteen-candle-power lamp is placed behind each negative. Flexible conducting cords from these lamps are wired in parallel to a single key-socket, attached to the under side of the bed. An electric-light cord of convenient length, and having an extension-plug at each end, is used to connect the apparatus and the other attached to the source of illumination selected. For concentrating the light on the negative an ordinary metal shade, or reflector, surrounds the electric-light bulb, which should preferably be of ground glass. An even diffusion of the light is still further secured by having one side of the negative frames covered with a sheet of ground celluloid, which is lighter and less fragile than ground glass. The lamp brackets are adjustable vertically, and, as they are attached to an independent base, the distance between the light and the negatives may easily be regulated, according to the varying density of the plates. Where an electric-light plant is not available, Welsbach gas lamps, or acetylene bicycle lamps, may be substituted for the illumination.

The negative-holders are square and large enough to take in plates of all sizes up to and including eleven by fourteen inches, and may be placed in the frames either vertically or horizontally. For the smaller-sized plates it is advisable to use masks of black press board, or other material, to cut off all extraneous light. The left-hand frame in the illustration shows a mask for an eight by ten plate in position.

Although this apparatus is somewhat large, the bed-piece being six feet long, it may be stored in any ordinary closet, as all the movable parts are detachable. The mirrors are fastened to the slide by thumbscrews and are so hinged as to fold upon themselves when removed from the apparatus.

The negative frames, lamp-brackets, eye-screen, key-socket, etc., are also readily detached, leaving nothing but the bed-piece with the legs, and as the latter are hinged and fold against the under side of the bed very little space is required for it. The apparatus may be set up, complete for use, in less than five minutes.

# The Journal of Advanced Therapeutics

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No. 3.

## GENERAL CONSIDERATION OF ELECTRO-THERAPEUTICS.\*

BY ERNEST WENDE, M. D., BUFFALO, N. Y.

A speaker in my position is most often akin to the minstrel at the feast in olden times. He is our pæan-writer, singing of our victories of science, and glorifying scientific heroes, and, in telling the tale of good deeds done, he points the way to our conquests.

Necessarily, therefore, a typical presidential address would probably be a review and summary of the work done by the Association during the year. The rule to adhere strictly to that type will, on this occasion, be honored in the breach rather than in the observance.

Our eleventh annual meeting finds us in the Electric City—the city in whose electrical problems we all have taken so much interest—the city whose future depends so much upon electricity.

It was here that Father Hennepin, the Franciscan, first set foot on the shore of Lake Erie in his thrilling, romantic, and inspired expedition of exploration and Christianizing. It seems pertinent, also, to recall the claim of Buffalo to being termed Electric City. Its justification is not without significance and fascination, for no city in the universe is so endowed—none so presurmised for Elysian fields.

For ages the power of Niagara and its realization has been a matter of speculation and prophecy, and to-day, few people appreciate that the era of tentative method, trial, and hope is past, for what has been long talked about is here—22,000 horse power from the Niagara, one-fifth of the potent energy used in the city, is that conveyed from the euphonious and

\* President's Address. Read before the meeting of the American Electro-Therapeutic Association at Buffalo, N. Y., September 25, 1901.

mighty Falls. We dreamed of the time when our frontier would be a line of industries, all using the electric power, when the city would be smokeless and a hive of assiduous activity, when power would be cheaper than coal in the coal fields. Our dream is no longer a myth. The municipal lights that guide you, the telephones that talk to you, the cars that carry you, the hum of the factories you hear, and, virtually, the currents that cure you, all subservient to the comfort and happiness of mankind, without any interference, directly or indirectly, procure their potential energy from the great cataract.

The electric era of Buffalo has dawned. By virtue of the productive and invincible Falls of the Niagara, and with the facilities offered by the superb modern plant, electric energy can be had and studied as in no other place in all the world.

Briefly, the interesting features, as though we were unconsciously standing on the brink of great discoveries, connected with history, are the dates that mark a step in the progress of its electrical evolution.

The commencement of the success of the efforts of the human mind to utilize the fruits of the Niagara registers from March 31, 1886, when the original Niagara Falls Power Company was first organized. Four years thereafter, in March, 1890, the initiatory surveys were successfully consummated, while, in the autumn of the same year, the master-stroke of breaking the first ground was executed.

On April 16, 1895, the first power was generated and its potentiality recognized, affording means for possibilities yet to come.

April 26, 1895, records the power in readiness for general distribution in the City of Niagara Falls.

June 26, 1895, we found the machinery in musical harmony with the gush of the gurgling sluice working triumphantly in full capacity.

November 16, 1896, the Street Railway Company, to relieve that noble animal, the horse, brought one thousand horse power to Buffalo.

In the Fall of 1897 other consumers were supplied, and the employment of the power became universal.

On November 22, 1898, it was first employed for lighting, when Main Street was illuminated, while, in August of the

following year, it was in general use throughout the city for this purpose.

No part of your visit will so amply repay you as a journey to this magnificent system by which the power is created, transmitted, and utilized.

The wonderful inventive genius which the opportunities called forth can in no other way be appreciated than by inspection.

In turning to the medical aspects of electricity the field is indeed pregnant with suggestions.

The most pressing question, at the present time, for the electro-therapeutists to ascertain is, whether the treatment of disease is to depend on mere opinion, which varies with each doctor and perishes with the individual, or on the laws which, founded on the immutable truth of facts, can never perish, but must endure through all ages.

When laid open in its native truth and simplicity, electricity will be found, like other arts and sciences, to possess nothing that is very mysterious or difficult of comprehension, nor anything that should prevent its principles, at least, from becoming one of the subjects of ordinary study with men who have received such an education as enables them, as amateurs, to derive profit and enjoyment from analogous studies, such as chemistry, physics, and natural history in all its branches.

To such men, electro-therapeutics will be found to yield instruction of the highest and best kind, to say nothing of the great advantage such knowledge must be to themselves and patients.

While electricity has been wrested from the hand of the charlatan, and it is no longer looked at askance by the physician, it would seem that this Association has within its province the duty of making known to all its superb therapeutic properties, and the indications for its employment.

However, it may be stated that the attitude of the general practitioner towards electricity has changed for the better. He either uses this agent with some understanding or leaves the matter to those who specially work in this field.

To be sure, the magic of the X-ray, the use of the electric light and actual cautery, and some other general facts, are common knowledge, while virtually the present state of the subject is but imperfectly understood. When it is, many

cases that now drift from bad to worse will be referred to the specialist with confidence of results obtainable through this department of therapeutics, for, as knowledge is generally disseminated, it will be, likewise, recognized that electro-therapeutics is not a simple subject to be treated superficially, but that it is a deep, progressive science, demanding varied knowledge—a perception of the varieties of maladies, the conditions amenable to treat, the various currents, a familiarity with the apparatus, and how best to adapt them under diverse circumstances, all of which can only be possible to one who devotes the greater part of his time to it; therefore, the justification and necessity of the specialist in this line.

Human maladies never should be left to the chances and uncertainties of a treatment which is neither precise in its indications, direct in its action, nor positive in its results.

Facts, illustrating not merely the possibility of such a specialty but demonstrating its reality and power, must be familiar to everyone, and the observation of such facts must, of necessity, have led to its recognition even in the earliest times.

The possible electro-therapeutic applications are many. A brief reference to those conditions which the general practitioner should be made familiar with appears pertinent. In respiration and cardiac failure,—particularly in cases of apparent death from drowning, poisoning from aconite, chloroform, or opium,—electrization is a powerful antidote through stimulation of the pneumogastric nerve. In these instances, how often, as illustrative of the want of exact or proper knowledge, is not electricity resorted to in a most useless way, both as regard currents and method.

No class of patients are victims of greater and more prolonged suffering than those with enlarged prostate. With no class of cases, on account of their age, chances of failure and death, are operative surgical measures more uncertain. Many cases are condemned to drag out a wretched, catheterized existence.

In all these, Bottini's operation holds out more possibilities, with less risk, than any other procedure.

In its present modified form, with improved instruments, it can be accomplished practically without an anaesthetic or pain, with the certainty of obtaining relief and improvement, in very many cases, and cure in a goodly number. No operation promises so much with so little proportionate danger. Many

surgeons are yet skeptical, many prejudiced; so it becomes our duty here, as in other instances, to enlighten the profession.

No class of ailments are more discouraging than chronic rheumatism, neuralgia, and gout. Yet, how in need of enlightenment are the great mass of our brethren as to the assistance to be given them through electro-therapeutics. In their treatment it is a great mistake to exclude this agent from the class of positive remedies; as it is a vulgar and most injurious error to limit the cure solely to the administration of drugs and medicaments strictly so-called.

In the chronic form of rheumatism, currents of high frequency are most effective, whether we have a primary attack or a consecutive one.

In these cases success is the rule, if persisted in, remembering that chronic conditions require long-continued applications. No class of chronic ailments have been so satisfactorily improved, especially so, if it is recalled how futile other methods prove.

If the profession generally were familiar with the good results possible in these types of medical and surgical diseases, for which the medical men now, too often, can do nothing, and to whom they become a burden, it would repay the effort, as they constitute an enormous class of the sick for whom so much is attempted.

The investigation of the restorative and therapeutic property of the chemical rays of the electric light in tuberculosis continues to be a most interesting and fascinating subject. What greater triumph can be hoped for, if, through electricity, we are to exterminate this scourge of the race.

The possibility of early recognition of lung changes by means of the X-ray, and their curability by means of the electric rays, is no visionary thought.

The explanation of the rationale is found in the undetermined, as yet, but great penetrating power of the light which may undoubtedly be a direct germicide, in its power, as well as to sterilize the air the patient is breathing, modifying it also that it becomes remedial.

With the general appreciation of the fact, cases would be referred in such numbers for treatment as to justify proceeding on a large scale.

Much could be said, in the same direction, of cancer. To

Massey and his work in this field, too much praise cannot be given. The proportion of cases given over to death is necessarily large.

Perhaps the best procedure is the method of cataphoric destruction by nascent salts of mercury, through electric conversion of metallic mercury injected into the growth in a soluble oxy-chloride, to be diffused in all directions throughout the neoplasm; converting it into a dead, odorless mass which drops off, leaving a clean wound for granulation.

It is capable of removing in a bloodless way, as thoroughly as by the knife; hence is adapted to tumors in inaccessible situations and in weakened individuals.

It is unaccompanied by risk of auto-inoculation, the germs being at once destroyed. The zone of action can be extended beyond the limits of the growth without harm to normal tissue on account of the greater rapidity with which cancer cells succumb to the diffused salt than the healthy ones.

One of the most cogent illustrations of the apathy of the surgical world in relation to electricity is in regard to urethral stricture.

That urethrotomy, internal and external, is both unsatisfactory and accompanied by danger admits of no discussion. Operative procedures of this character are not curative, and palliative in but a limited sense.

That by electrolysis, as originated and developed by Newman, these cicatricial contractions are capable of being absorbed, has been verified beyond peradventure, and when this method, with its absence of risk, inconvenience, suffering, and excellent results, is considered, it appears to be almost incredible that it has not superseded other modes of treatment.

This apathy, which extends throughout the domain of surgery, can only be explained by the lack of proper equipment and knowledge on the part of the profession and by the general tendency of surgery, to-day, to run to operative action wherever anatomically possible. It is another illustration of the fact that our surgeons are not accomplished physicians as well. The field of surgery is full of opportunities for conservative work by electricity.

Wherever spasm exists, when the treatment of epithelioma, lupus, carcinoma, is beyond ordinary attack, in obstruction of

the bowel, in hernia, and in many other cases the intelligent use of electricity is indicated.

Glancing at gynecology, the same apathy is largely found, and yet the field may be said to be even larger and as promising. Much of the indifference arising from failures is, without question, due to the lack of knowledge by those who have made attempts in this direction.

It emphasizes the need of college instruction which should include every department of this specialty; the laws of currents, construction of batteries, currents and their indications, laboratory work, clinical facilities. When this is brought about, the medical man will be greatly fortified in his ability to treat disease, the public vastly benefited, suffering diminished, and the death rate induced.

To this end, let this Association use its influence and endeavors.

Until accomplished, it is the duty of this body to show its work to the general profession and in this way educate and create the proper sentiment.

To enable us to comprehend the origin, progress, and final recognition of electro-therapeutics, as a distinct object of intellectual study pursued among civilized men, it is hardly necessary to look into history.

The slightest reflection on such common incidents as those above noted, coupled with what everyone knows of the frequency, causes, and character of ordinary diseases, must show that the rise and establishment of such a specialty were inevitable.

I will venture to add that unremitting attention in its application will bring about results of an infinitely more satisfactory kind than can ever await the efforts of the physician who disdains to take up so humble a ground of action, but persists in seeking to vindicate himself as a conqueror of disease, solely by the use of the knife and the administration of drugs.



## OZONE IN TUBERCULOSIS.\*

J. D. GIBSON, M. D., BIRMINGHAM, ALA.

The chief subject of this paper, "ozone," is probably the most ancient remedy known for the cure of disease; it is little understood, and its value greatly underestimated at the present day.

This great scavenger of nature, and purifier of all decompositions, as well as nature's great agent for keeping the air we breathe and the water we drink, pure and wholesome, was named "ozone" by Schöenbein in 1839.

We know that ozone is an allotropic form of oxygen, and I suppose we would not miss it much if we say that it is a very active, energetic form of oxygen, more stable than ordinary oxygen as it assumes a gaseous form and can be compressed into a liquid state, thus being transportable and available for local or general applications, while O<sub>2</sub> is so unstable its use is very limited in medicine.

Olding,† in 1861, suggested that ozone was a compound of oxygen with oxygen, the combination resulting in a contraction.

In 1863 Soret was the first to prove ozone was oxygen reduced to two-thirds its volume, and according to this the ozone molecule consists of three atoms of oxygen, as O<sub>3</sub>, while ordinary oxygen, O<sub>2</sub>, contains only two atoms.

Bauma styles the combination of oxygen as follows:

O<sub>2</sub>, ordinary oxygen.

O<sub>3</sub>, ozone.

O, active oxygen; the latter being the most active oxidizing agent known.

Many early investigators became very enthusiastic over the wonderful powers of this agent, but failed to get a hold on the profession at large, probably on account of the great difficulty in procuring it in large quantities when needed.

It has always been an agent that has attracted the attention of investigators, and we see, even in the very early days of medicine, physicians sending their patients to the seashore and

\* Read before the American Electro-Therapeutic Association at Buffalo, September 26, 1901.

† Dr. W. J. Morton: "Ozone and Its Uses in Medicine."

mountains to get the supposed benefits of fresh air, or where it contained more ozone. Ozone is produced in many ways. We find it in the forest, mountain tops, and on the seashore, while there are some few regions whose peculiar climatic conditions are such as to cause the air to be especially rich in ozone.

Lightning during thunderstorms causes the air to become charged with its refreshing presence, and really in this way man first detected the presence of ozone by its peculiar odor.

There are many ways of producing ozone artificially, many machines have been made for that purpose, but the one I have used is one for collecting it for office use from the static machine.

It is simply a large glass jar with an electrode or conductor passing in at either side and terminating in a ball; these are connected with the prime conductors of a static machine and the spark takes place within the jar.

The ozone is produced by the sparks decomposing the air in the jar, the quantity is regulated by the length of spark and the movement of air in the jar. There are two openings in jar, one for entrance of air and the other for egress of air and ozone.

I have used it without forcing the air through the jar and with compressed air forced through the jar, and with compressed air medicated or a nebula of creosote, eucalyptol in alboline forced through the jar. I like the nebula best; it seems to have the most beneficial action, and the tightness and asthmatic symptoms are not so quickly produced.

When the machine is in rapid action the taste and smell of ozone are soon noticed and quickly becomes too strong for inhalation without special care in regulating its strength, producing asthmatic wheezing and very uncomfortable symptoms.

When used properly it has a cleansing effect on the lungs, causing considerable cough and expectoration, which pass off in a few minutes and leave the patient feeling much better, and I find sleep and the appetite are very much improved. Ordinarily there is a decided increase in oxyhemoglobin in the blood, with increase of leucocytes and a rapid increase of weight in patient during a course of treatment.

In the use of ozone by inhalation we all think of tuberculosis

pulmonalis at once; and what will be its final results in the treatment of the "great white plague" is the question.

While ozone cannot be heralded abroad as a panacea for every case of tuberculosis, in any stage of the disease, yet I think my cases, which are reported in this paper, will prove that in it we have a very valuable therapeutic measure, and in connection with other approved measures it will aid us to save the lives of many cases otherwise hopeless.

**Case I.—H. D. (colored), about thirty-two years of age; normal weight, 210 pounds; naturally stout and athletic.**

	HOUR	TEMPERATURE	PULSE
June 17, 1901.....		103	115
" 27, " .....	8:00 A. M.	98½	75
July 27, " .....	"	97½	67
August 1, " .....	6:40 P. M.	98	70
August 9, " .....	6:30 "	98½	70

**Remarks.**—Had been confined to bed for six weeks and under treatment five months. Much hemoptysis and night sweats; consolidation of right apex, and many râles over upper portion of right lung and infra scapular region posteriorly.

He returned to his occupation, laborer in machine shop, on August 5, having normal temperature morning and evening, and has continued at his work daily, seemingly without return of symptoms. His weight was, July 1, 180; August 1 was 196; a gain of 16 pounds for the month of July.

**Case II.—S. S.**

	HOUR	TEMPERATURE	PULSE
July 25, 1901.....	8:30 A. M.	101	120
" 26, " .....	9:00 "	101½	
" 27, " .....	"	99½	116
" 28, " .....	9:00 "	100½	114
" 29, " .....	8:30 "	101½	115
" 30, " .....	8:40 "	99½	104
" 31, " .....	8:40 "	99½	100
August 6, " .....	5:00 P. M.	102	120
" 10, " .....		101½	112

**Remarks.**—August 5 the patient suffered an acute attack of indigestion and dysentery which caused the symptoms to become aggravated, and I suppose she became discouraged and gave up treatment, to my very great regret, as she was just entering the third stage and I was anxious to give her a

thorough test. She lived a long distance from the office, which was greatly against the patient in her weakened condition.

Case. III.—W. M. (white), sixty-seven years old; having hemorrhages occasionally for two years, and constantly under medical treatment. I was called to see him first about July 10, when he had an alarming hemorrhage from the lungs in one of the city parks, and commenced treatment.

	HOUR	TEMPERATURE	PULSE
July 15, .....	8:00 A. M.	99 $\frac{1}{2}$	90
" 27, .....	8:00 "	98 $\frac{1}{2}$	74
" 30, .....	8:00 "	98 $\frac{1}{2}$	64
August 1, .....	8:00 "	98 $\frac{1}{2}$	63
" 23, .....	8:00 "	98 $\frac{1}{2}$	62

Remarks.—This man had repetition of hemorrhage, several slight ones, from August 5 to 15, which stopped his improvement in weight temporarily, but since August 15 has had no more hemorrhages and his weight has gone from 138 to 147, and he has improved immensely; while there is some consolidation of upper right lung, it seems to be less and the râles are much fewer.

Case IV.—B. G., hopelessly ill with tuberculosis.

	HOUR	TEMPERATURE	PULSE
July 3, .....	3:00 P. M.	104	130
" 26, .....	5:00 "	101	110
" 30, .....	5:00 "	100	104
September 5, .....	5:00 "	103	110
" 8, .....	5:00 "	102 $\frac{1}{2}$	114
" 12, .....	5:30 "	101 $\frac{1}{2}$	118
" 21, .....	5:30 "	100	118

Remarks.—This man is one whose condition is hopeless; I really have been treating him only for experimental reasons. I think he would have been dead long ago if it had not been for ozone, and my faith in ozone is strengthened by its effects in his case, though unsuccessful.

While there are other cases that could be reported, nothing but repetition would be added. Case I. I consider a triumph, pure and simple, for ozone, as other physicians had given him cod-liver oil, creosote, etc., which I gave him also, but he continued to get worse every day, while he began improving immediately on the ozone.

The improvement in Case III. is equally marked, but there is still induration and râles, but he is progressing to-

wards recovery with great rapidity, and with the ozone had gained in actual weight nine and one-half pounds, when he has constantly been losing flesh for two years, while taking cod-liver oil and other tonics all the time.

Mr. President: I believe we have in ozone a very great help in the treatment of tuberculosis.

In the treatment of this disease we can verily appreciate all means, and everything that will help us aid the patients. Ozone must be so regulated that they can bear it—they are prone to take it too fast and too much, and thus produce an irritation that is absolutely harmful; when managed properly, I believe it will be our greatest agent next to diet and rest. I wish to say that in all my cases cod-liver oil and creosote have been used and an effort made, especially in the advanced cases, to force nourishment to the limit of the patient's endurance. This, in office cases, is difficult of performance, but in sanitarium patients is readily managed. Where there is much fever strict rest, in bed or hammock, is advised. I believe many of our office patients who are so weak and debilitated, if they could be brought into a sanitarium and saved the worry of going back and forth, would receive much greater benefits.

In conclusion, I would say of first importance in the treatment of tuberculosis is forced feeding; second in importance, rest; third, ozone by inhalation; fourth, creosote by inhalation and in large doses internally, and cod-liver oil.

I believe in a sanitarium where these measures can be carried out and the patient intelligently looked after. He will have a much greater chance of getting well than any change of climate can give him.

September 19, 1801.

#### DISCUSSION.

Dr. C. O. Files said that he had used ozone by the method described in the paper with very marked effect in many cases. The author's point was well taken, that all cases of tuberculosis can be benefited, and, in the first and early part of the second stage, cured.

Dr. T. A. Pease thought that perhaps one-third of the cases of tuberculosis could be cured if taken in time and treated in the manner described.

Dr. W. J. Morton said that, in the open method of manufacturing ozone from the atmospheric air, one must remem-

ber that four-fifths of the atmosphere is nitrogen. The very same spark which produces ozone dissociates the nitrogen and produces nitrous acid—a very irritating gas, when inhaled. The speaker said that he had experimented in this field some years ago, and had passed the ozone through a solution of caustic soda or potash in order to eliminate this nitrous acid. This gave pure ozone, a more agreeable substance to breathe. In the ordinary ozone inhalation apparatus sold with the static machine there was one defect; i. e., absence of any provision for the elimination of the nitrous acid formed. Possibly, however, this acid was what affected tuberculous patients so beneficially. He would not attempt to say.

Dr. Gibson said that not a single case of tuberculosis that he had treated with ozone had failed to be benefited. In order to do the right thing by his patients he had used, in addition to the ozone, all the usual and approved measures, but all of the cases had improved much more rapidly and satisfactorily under the ozone treatment than without it. For the last two weeks his machine had worked badly owing to the humidity, and in one case it had been necessary to do without the use of ozone and make use only of the inhalations of beechwood creosote. During this period the man's temperature had risen rapidly, but it had quickly fallen to the normal, and his condition had improved so soon as he had been again able to use the ozone. The apparatus consisted of a glass jar with a large stopper in the top and an electrode of the static machine introduced on either side.



## THE EFFECTS OF ELECTRO-STATIC MODALITIES UPON HYPERÆMIA AND PAIN.\*

BY WILLIAM BENHAM SNOW, M. D., NEW YORK.

Deeply sensible of the fact that the employment of the currents and other modalities of great potential is a subject of more than ordinary interest, and that each of the fellows has valuable views to present, it is the purpose of this paper to consider certain conclusions to which the writer has arrived, with a view of calling forth an earnest discussion, thereby better qualifying and modulating or, if we are not too sanguine, confirming the views to be presented.

If what we believe to be the result of correct analogy, based upon good premises, is here confirmed, the truth should be made known in such a way that the profession at large may be induced to appreciate and accept the facts evolved. For if the writer's views are correct, medical electrology will not be long knocking for recognition.

This is no time for apologetic expression of salient facts, no time for cloaking an honest enthusiasm, in the face of a majority who are ready to ridicule the presentations of those who have devoted their earnest efforts to the adaptation of electricity to the relief of human suffering. Let it be said with honesty, boldness, and energy.

The evolution of the currents of high potential has been mainly the work of the two past decades. Most of us well remember having been taught during that period that we were to rely upon the constant current for the relief of inflammatory and painful affections, and how disappointing it has proved.

In the meantime, alteration was taking place in the apparatus of the interrupted current; the short, coarse wire coil had been replaced by the fine wire measured by hundreds of yards, thereby greatly augmenting the electromotive force. Devices also for increasing the rapidity of interruptions had been invented, and behind all were placed several Leclanché cells. A current of increased voltage and greater frequency had been produced, and the constant current then took second place in cases calling for anodyne and tonic effects.

\* Read before the American Electro-Therapeutic Association at Buffalo, September 25, 1901.

At about the same time the sinusoidal current, possessing greater merit for some purposes, was introduced, but was also wanting in the degree of potential and frequency of alternation or oscillation which would produce the intense vibratory electrical effect that would profoundly impress the centers and the tissues locally as that now derived from the modalities of very high potential.

The static induced current, introduced in 1881, but (for reasons too apparent to discuss) not in general use until more than ten years later, was the first decisive step towards the introduction of the currents which are revolutionizing modern electro-therapeutics, placing the science in the first rank as a means of relieving pain and inflammatory processes.

In justice, it must be said that there have been many distinguished workers who have developed the other valuable static modalities. Yet, singularly enough, the position of most neurologists toward franklinism, as towards the constant and interrupted currents, at present is to consider it only a means of suggestive therapeutics. That in such position the learned gentlemen are in error, there is abundant proof, from the results of administrations to diseases of the nervous system certainly not amenable to suggestion.

The certain effects of these currents, and other modalities of great potential, in relieving pain and hyperæmia, superficial or deep, active or passive, is good ground for the preceding affirmation.

Pathologically considered, hyperæmia arises from circulatory disturbances due to pressure, traumatism, obstruction, or paralysis of the muscular coats of the vessels, of which one type, at first passive, may become active or congestive. The other type of hyperæmia is active, leading on to congestion in its early stages. These are induced by traumatism, exposure to heat or cold, the presence of germs, tissue necrosis, or of other sources of irritation to which the parts are subjected.

"When a strong stimulus acts upon a muscular part (say Landois and Stirling), hyperæmia, redness, and swelling occur. In congestive hyperæmia under the microscope we see (1) dilated blood vessels overfilled with corpuscles; (2) the stream becomes irregular and slower; and next (3) stasis occurs and the blood vessels are plugged. During these processes, the white corpuscles, and, less often, the red escape into

the tissues, plasma exudes, and swelling results. Under favorable conditions the stasis may disappear."

If tissue proliferation is not deferred on account of the intensity of the inflammation, regeneration, which takes place in cases in which the congestion is mild in from eight to twelve hours, will be established permanently and without hypertrophy. If, however, the stasis is allowed to persist, tissue necrosis results and repair may be long deferred.

The processes of regeneration are often delayed by one or more of the following causes: (1) The exciting cause may still be present; (2) the inflammation may be intense and the stasis and swelling persist; (3) the lymphatics may be inactive and slow in removing the products of inflammation; (4) the exuded fibrin and degenerated blood cells may be deposited in the vicinity of structures not well supplied with lymphatics, as so often happens in the joints, and there remain producing ankylosis or other impairment of motion; (5) the presence of micro-organisms which develop characteristic tissue change and degeneration, delay restoration, and, if not removed eventually destroy the part; (6) there may be retained necrosed tissue, as dead bone; (7) in diathetic diseases, it does seem that irritants have either accumulated at the site of the inflammatory processes or are being constantly poured in.

In both types of hyperæmia, the indications are apparent. That electricity of great potential, high frequency, and small quantity removes obstacles to regeneration and promotes normal tissue proliferation can be demonstrated both by analogy and experience.

Whether the properties which effect the results to which we will refer are due to the intense penetrating vibration at the site of administration, or to the actions peculiar to electricity,—chemical, electrolytic, or cataphoric,—or to both, is the question. To the writer, the vibration seems the essential effect, and we are certain that no other mechanical agent can produce the degree of intensity, frequency, or penetration which we obtain from the electric machine, which has the frequency and amplitude controlled by a spark-gap, in association with a current output, that can be increased or diminished. Nor can any other interrupter or mechanical vibrator be constructed in connection with electrical apparatus to modify all of the quali-

ties of fineness, amplitude, and frequency that are provided with the spark-gap and a regulated current output.

That the electrical action of the currents, electrolytic, cataphoric, or electro-chemical, are not essentially of value in relieving these conditions, we believe is proved from the fact that the best results are obtained from the currents that possess those qualities in the least degree. That there is an energizing, stimulating effect upon cell protoplasm derived from these currents that is not induced by vibration, there is abundant proof in the general sense of well-being that follows an administration; but that these are caused by the well known electrical effects above referred to, we doubt from experience. It seems more likely that an influence effect by induction, if you please, without altering the cell structure, creates normal action which, in accord with nature's law, leads to regeneration and restoration. Whatever this subtle influence may be, its presence is unquestionable and deserving of consideration.

The induction of activity, both local and general, contributes in all inflammatory conditions to the removal of the cause, and to tissue proliferation with regeneration.

Clinical experience with many conditions has demonstrated the following facts, which it is difficult for controversy or argument to weaken or disprove:

Electro-static modalities (1) remove stasis; (2) promote absorption of plasma and other detritus, thereby (a) lessening pain and swelling, (b) removing deposits of fibrin and disorganized blood cells in the vicinity of joints, (c) inducing the reabsorption of organic and inorganic salts which have become locked up in the tissues as a result of defective metabolism; (3) they produce a general equalization of the blood currents to all parts of the body with well-marked lowering of arterial tension, which decidedly lessens the possibility of local congestion; (4) there is positive proof that a local expression of blood from the vicinity of the lesion takes place, the probable effect of the contraction of the walls of the arterioles; and (5) regeneration and restitution are hastened.

The relief of passive hyperæmia occurring with marked œdema in organic disease of the liver, heart, and kidneys, and in cases of varicose veins, resulting from thrombosis of the large veins of the lower extremities, offers but little encouragement from electro-static treatment. Those arising, however, from

lost tone of the arterial or venous walls, functional derangement of some part of the glandular system, pressure due to constipation, or cases associated with surgical oedema following operations or accidents, are successfully treated in all but exceptional cases by one or another of the static modalities. Early attention greatly enhances the prospect of a prompt restoration to normal, the principle *a priori* in all cases ; the degeneration and structural alteration either precluding the possibility of restoration or requiring much longer time to induce a recovery approaching the normal. When a large gland, as the liver, is the seat of hyperæmia, the application of a metal electrode over the organ, and the employment of the wave current measured by as long a spark-gap as can be administered without inducing disagreeable muscular contraction, for at least fifteen minutes daily, is effective. If the hemorrhoidal veins are the site of the hyperæmia, at the same sitting employ locally a rectal electrode with a spark-gap at least four inches in length. If there be chronic congestion of a large viscus, it may be necessary to apply sparks directly over the organ. When the organ is tender to pressure, which has not been removed by the administration of the wave current, apply the brush discharge over a surface larger than the organ until a distinct rubefacient effect is produced, and the tenderness will generally be relieved.

Sparks are the best means for overcoming a condition of constipation.

In cases of surgical oedema, great satisfaction will be derived from the static treatment, because tone and activity are restored to the parts, active lymphatic secretion induced, and the stasis and oedema removed.

The same general action takes place in numerous other cases of passive hyperæmia, which it will be unnecessary to mention.

To the effects upon acute congestive hyperæmia we turn for the great triumph of modern electro-therapeutics. The same rule applies here as in all cases : Early administration insures a prompt restoration ; in all others, time relative to duration, and the probability that recovery will be incomplete, or if a pus cavity has formed, its removal by the knife must precede or replace electrical treatment.

Therapeutically, the static modalities meet in a most complete and satisfactory manner the essential indications in in-

flammatory conditions not characterized by the presence of micro-organisms beneath the surface, or of some foreign or necrosed substance which cannot be promptly absorbed.

The modalities of particular value in influencing these conditions are the wave current, the brush discharge, sparks, and spray, which produce the following effects:

1. Throughout the economy, normal functional activity is induced, associated with the maintenance of the nutritive and secretory processes.

2. Stasis, the first disturbing influence to the processes of repair, is promptly removed.

3. In acute cases the exudate, which may have accumulated, is absorbed and the swelling often largely disappears during an administration.

4. In chronic cases, fibrin and other products of inflammation which are deposited in the tissues, as they are especially apt to be in the vicinity of joints, are gradually separated, when not too deeply situated in the structures of the joint, by the vibratory action of the wave current, or still more effectually by the long percussion sparks.

5. Healthy active metabolism is induced and the processes of cell proliferation and restitution are undoubtedly accelerated.

6. When indolent or irritable ulcers, or affections associated with the growth of bacteria, are present in the skin, remarkable anodyne, oxidizing, and stimulating effects are derived from the administration of the brush-discharge.

7. There is marked lowering of the general arterial tension, which is most prompt when sparks are administered and most prolonged after an administration of the wave current.

8. At the same time, there is locally introduced by the wave current, sparks, or brush-discharge a contraction of the arterioles in the structures immediately beneath the surfaces, with marked diminution of local congestion.

9. Prolonged administrations of the brush-discharge or spray produce beneficial rubefacient effects.

10. Pain promptly disappears from the first, and will not return if administrations are sufficiently frequent to control the congestion.

That these effects are produced is demonstrated daily in the experience of those who make correct use of the modalities.

No class of cases better illustrate the valuable results to be obtained from the electro-static treatment than the acute and chronic joint affections.

In the paper read before this association at the Washington meeting two years ago the writer then expressed his views upon the treatment of rheumatoid arthritis, and time has only served to confirm the opinion then set forth. In another paper on the treatment of joint affections, read before the Post-Graduate Society, and published in the Post-Graduate for December, 1891, were reported a number of cases of various joint affections and the methods of treatment. There is no class of inflammatory affections which so taxes professional skill as joint diseases. No better evidence can be presented that other methods are not so successful as the electro-static, than the fact that many cases which have stubbornly resisted skillful management by other most approved measures have been promptly cured by the electrical treatment. Of more than two hundred cases treated and cured, at least nine-tenths of them have marked the failure of other methods. Actual cautery, strapping, rest in splints or otherwise, blisters and other methods of counter-irritation, heat, cold, and internal medication singly or in combination assist in the cure of mild cases, but in severe cases prove utterly ineffective. For all such there is one natural termination, ankylosis, to which all cases tend and which rest facilitates.

The writer's experience has convinced him that when ankylosis has not already taken place, and the lesion is not of one of the class excepted,—tubercular, malignant, gonorrhreal, etc, —and the joint structures have not been affected, the inflammatory process can always be stopped, and much, if not all, of the products of inflammation be removed and the joint made useful and painless on motion. Sprains, rheumatoid-arthritis, and synovitis, acute or chronic, have yielded in every case when the treatment has been continued under observation—the acute cases promptly, and the chronic after patient treatment. It is the treatment *par excellence* for inflammatory joint affections.

Sciatica, brachial neuritis, and all other cases of neuritis, when uncomplicated, are promptly relieved and cured as by no other plan of procedure. Congestive affections of the spinal cord, as anterior poliomyelitis and tabes dorsalis, are

also relieved. The earlier the institution of treatment in these, as in all cases, the better the prognosis.

Inflammatory glandular affections are most remarkably relieved and cured, barring the rules of exception, by one or another of the static modalities. Prostatitis, ovaritis, orchitis, tonsilitis, mastitis, and congestion of the larger viscera often call for special administrations—always in accord with the general plan of treatment. Superficial inflammatory diseases, as many skin affections, are promptly relieved. We believe that there is no local treatment for eczema so successful as the brush discharge—the aggravating pruritus is relieved at once and the eruption disappears as well. Herpes zoster, hives, the erythemas, and many other skin affections are promptly relieved by the same means.

These are statements of fact based upon results too often obtained to be denied, and are, we believe, sufficient to demonstrate beyond question that the static modalities *do* relieve pain and hyperæmia as no other procedure can, because it is impossible for any or all combined to so effectually meet the indications and requirements.

Before closing we will enumerate what measures are deemed as essential to the successful management of the hyperæmic and painful affections:

1. The best modern static machines, with a capacity equivalent to an output of current and possible electromotive force of a scientifically constructed Holtz machine having at least eight revolving plates thirty inches in diameter, connected with a motor power under efficient speed control and capable of inducing three hundred revolutions of the Holtz per minute.

2. An insulated platform having glass legs at least eight inches in length, to prevent escape of the electrostatic charge to the floor.

3. The necessary electrodes and other paraphernalia.

4. A sufficient current administration adapted to the case under consideration to induce the desired effect, which will be governed, by the pain produced by the application, its gradual sedation until the effect is the same as under normal conditions, and the relief of pain and, possibly, of swelling.

5. The selection of the modality or modalities best adapted to the case to be treated, as follows:

- (a) The wave current is rarely contraindicated in cases of

pain or hyperæmia, and in one or another of its modifications is indicated as part of the treatment in all chronic and most acute cases. It is par excellence the modality for tonic or constitutional effects.

(b) The brush-discharge is invaluable in the treatment of skin affections, successful in many acute affections, as rheumatism, gout, sprains, orchitis, and all conditions where a rubefacient is indicated, a valuable adjunct or often a substitute for the wave current in the treatment of muscles which contract painfully, when the current is employed, as the muscles of the forearm and face.

(c) The sparks are of special value for reaching deep affections in joints or beneath thick layers of fat, for separating deposits of the products of inflammation, and for this reason are indicated in the treatment of chronic cases of sciatica and brachial neuritis and long standing joint affections.

(d) The spray may be employed as a substitute for the brush-discharge, but is in no particular its equal.

(6) The time devoted to the administration must be sufficient to produce a profound sedation and unquestionable diminution of hyperæmia. Such a condition will be determined by the relief of pain, complete when the affected parts are at rest, and complete or greatly relieved when in motion, and by marked diminution of swelling often discernible during the administration.

(7) The frequency of treatment must be so adapted to each individual case that there shall be but a moderate relapse between administrations, thereby "bridging" from gain to gain until there is no return whatever of the pathological condition.

If the diagnosis is correct as to cause, and the cause is not of exceptional character, as shown, and no unusual complication intervenes, congestive hyperæmia will invariably yield to the scientific administration of the static modalities.

Can these statements be denied?

Have the results obtained by the writer in hundreds of cases been exceptional? If others have not obtained equally good results, have they devoted sufficient time, and applied the necessary technique, to their cases? We doubt not that every fellow present is prepared to confirm in many, if not every, instance numerous noted examples that will verify what has been said. If, on the contrary, some have observed too

emphatic or unguarded statements, we earnestly desire that they be now controverted, and without regard, for the one purpose of this paper is to bring out the truth.

### DISCUSSION.

Dr. W. J. Morton said that the paper has covered a ground with which he was fairly familiar, and for this reason he wished to make some comment upon it. Probably all present recognized in general the truth of the statements presented in this connection. The proposed extension of electrical treatment into acute inflammatory diseases was the main direction of the writer's argument, as he had referred to it as "the triumph of modern electro-therapeutics." It would be indeed a triumph for electro-therapeutics if it should successfully invade this domain. So far we had not accustomed ourselves to that thought. He personally believed that we might already attack acute diseases with a certainty of effect that would not have been expected three or four years ago. A great deal of his own electrical work had been among acute cases. This extension of the field of electro-therapy had been made possible by an ability to use the different modalities. All of the members had probably used these different modalities in the various acute affections, with excellent results. He had not himself in the past few years hesitated to treat an acute case of rheumatism or gout or an acute sprain—in fact, any condition of acute inflammatory structural alteration. These conditions could be successfully attacked by the proper current, and probably more successfully than by the ordinary plan of rest or the use of cold applications. He recalled a case of intense and acute inflammation and swelling of the wrist. A plate of block tin, one inch in width and two or three inches in length, was wrapped around the wrist and the wave current applied. The pain had been quickly relieved, and the progress toward recovery had been more rapid than one would have expected. He had heard from different members of their invasion of acute stages of disease with these different currents, and he hoped this point would be still farther brought out in the discussion. This development and extension of electro-therapy was most interesting to him; it would not have been possible with the galvanic or faradic currents. He congratulated the author on his interesting and concise paper.

Dr. O. S. Phelps of Battle Creek, Mich., said that the writer had presented the subject most forcibly. Its special point of interest had been touched upon by the preceding speaker. Dr. Phelps said that in 1894 he had read a paper before this association, and had there detailed the history of a case of a pelvic inflammatory process, the basis of which had

been a uterine fibroid, together with a probable infection. The inflammatory exudate had not only filled the pelvis, but the abdominal cavity up to the umbilicus. The body temperature had been 103° F., and the bladder had been so impinged upon as to only be able to hold an ounce and a half of urine. It had been admitted, he believed, at that time that he had demonstrated conclusively the power of an electrical current not only to reduce pain, but an inflammatory process. A séance of twenty minutes had enabled him to bring down the temperature from one and a half to two degrees. This had been the entering wedge which had led to ultimate recovery. The situation had been so phenomenal that he had asked another physician to examine the patient at the very beginning of the treatment. After a course of treatment extending from July 6 to early in October, success had been achieved. This case showed that it was not a new thing to treat acute conditions by means of electricity. His results in this case had been secured by the use of a Kidder coil of fifteen hundred yards of No. 36 wire. The speaker then narrated the following case, one of chronic syphilis, illustrating the effect of a gumma, which by pressure had caused dilatation of the vessels and drooping of the eyelid—the exact picture given by Brown Sequard in his experiments on division of the sympathetic in a cat. The case had been the rounds of the medical profession, and had received all the classical treatment and all the remedies for sedation. Even subcutaneous injections of morphine had failed to give relief. Feeling that there was no use in going over the old ground again, he placed the patient on an insulated platform connected with an eight-plate static machine making 400 revolutions per minute. By means of a pointed electrode he drew from the affected part of the face a spray. The application had been made so that it did not produce prickling. A séance of twenty minutes would give absolute relief for several hours, the first relief that he had ever experienced except from the inhalation of chloroform. This was a most marked example, in his opinion, of the power of the static current to relieve pain and contract the vessels.

Dr. Francis B. Bishop said he also wished to congratulate Dr. Snow on his excellent paper. Recently in Paris the galvanic current had been used in acute cases, and where this had been done no ankylosis had subsequently occurred. Too much stress should not be placed upon static electricity to the exclusion of the galvanic. There are so many physicians practicing throughout the country who cannot purchase or make use of the static machine in country practice, that the capabilities of the galvanic current should be understood to the utmost. The galvanic current when properly used undoubtedly accomplished a vast deal. The tendency at the present time was to the use of large static apparatus, and it could not be denied

that certain physical effects could be produced with them which could not be obtained with the smaller apparatus, but conversely there were certain effects obtainable from the smaller machines which were not obtainable with the larger ones. The large static machine, with the same number of revolutions, would produce an electromotive force very painful to some patients. In extreme cases of neuritis he had found that the fine vibratory current of the small static machine was very soothing, while that from the larger machine could not be tolerated. He referred to the current obtained only from one side—not to the Morton current. The vibrations so obtained were very fine and soothing. The static sparks he had not employed in acute disease for a number of years, chiefly because it produced so much pain. In subacute inflammatory diseases, as for example sciatica, he had found the galvanic current decidedly preferable to the static. He used very large surface electrodes, pads, and all the current the patient could stand.

Dr. G. Betton Massey raised the question as to whether acute rheumatism should be treated by static electricity. It had been mentioned here favorably, although it was absolutely opposed to Apostoli's dictum of several years ago. We all agreed in the statements that had been made regarding the immense value of static electricity in the relief of chronic rheumatism. Apostoli had insisted that the pain of acute rheumatism was aggravated by the use of static electricity. Some years ago, and before that statement had been made, Dr. Massey said he had on two occasions unwittingly verified that statement. In one case, a single spray application to the head or to the dorsal region, made with an eight-plate machine run by hand, had been sufficient to lay the patient up, and he had never seen the person again. Another time, one application to a case of acute rheumatism decidedly aggravated the condition. More recently a seamstress had been sent to him with acute rheumatism. At the time she was still taking powerful anti-rheumatics, although she had been suffering from rheumatism for about one year. He had looked upon the case as sufficiently chronic to admit of the use of static electricity. The woman had, however, been promptly made worse, and after three treatments had returned to her family physician, who had been opposed from the first to electrical treatment. The electrical treatment had consisted in the application of the static spray to the knee. A fourth case was that of a dentist who had been sent to him for the static electricity. After one treatment he also had been made worse.

Dr. J. D. Gibson of Birmingham, Ala., said he agreed with the reader of the paper on almost every point made. The last speaker had probably referred to the communication presented in France by the nephew of the late Apostoli. Dr. Gibson

said that he had used the galvanic current with some success in some cases of rheumatism, but the success had not been nearly so great as with the Morton wave current and sparks. He had recently observed this in a patient at his sanitarium. The patient had suffered so acutely that it had been necessary for him to remain at the sanitarium because the humidity would not permit the use of static electricity. After one treatment with the static machine, however, the pain had been so greatly relieved that the man had been able to go home and come to the office for treatment. Galvanism certainly accomplished a good deal, but not so much as the static machine. In certain cases of sciatica and in neuralgia or obscure pains in the lumbar region, the static machine had sometimes been disappointing when he had been enabled to give relief with galvanism.

Dr. S. F. Wilson of Montreal, Canada, said that one point had not yet been mentioned, namely, that the speakers had spoken chiefly about one joint, and had omitted to say anything about the temperature and pulse so that one could judge of the severity of the cases under treatment. Where only one joint was affected there usually was very little or no rise of temperature or pulse.

Dr. W. J. Morton said that within the last year he had had two cases under treatment of acute inflammatory rheumatism in children. One of these was a boy who had come every day from Brooklyn in a cab. He had been sick five or six years, and had had two or three attacks each month. He was continually relapsing into typical attacks of acute rheumatism, in which several joints would be affected. The endocardium had also become involved. He had taken the temperature in this case, and had made a complete record. Under daily applications of the wave current the boy had been restored to health. The spinal electrode had been applied to the spine and also anteriorly. The child had been previously treated most carefully with the salicylates and in other ways, yet hitherto nothing had prevented these frequent relapses. The boy made a splendid recovery, and at the time of leaving the city for the summer vacation had no evidences of rheumatism save some remains of the old endocardial difficulty. When it was desired to give constitutional treatment with the wave current some point must be selected for the application of the electrode. He had formerly selected the spine for this, but because of the immense mass of muscles there he had later made use of a five by four inch plate of block tin placed at the beginning of the sternum. This spot had proved particularly satisfactory.

Dr. G. Betton Massey said that in the cases quoted by him all of the aggravations had been produced by a strong spray treatment with the positive pole. It was possible that the patient

went out bathed in perspiration after such treatment. One of his patients, at his suggestion, had gone back to the salicylates, and had returned three months later and had been then promptly relieved by the electricity when the salicylates had failed.

Dr. C. O. Files of Portland, Me., said that he had been deeply interested in Dr. Snow's paper, and he could, if desired, recall many cases to fortify almost every statement there made. One point, it had seemed to him, had never been sufficiently exploited in this Association. There were cases in which one could not use the spark, the spray was entirely inefficient, and in which possibly a massage roller would, under certain circumstances, accomplish the work. He had had scores of cases of acute rheumatism in which the static electric roller applied fairly strongly, but within the tolerance of the patient, had given complete relief within a few days. One case came to mind in which the patient had suffered from rheumatism for many years, and had often been laid up for months at a time. A daily treatment of fifteen minutes for five or six days had given relief for about one year. In using the massage roller it was necessary to graduate it with considerable care. In warm weather there was, of course, considerable moisture about the clothes, and it was not possible to convey any sensation to the patient by the roller on an insulated platform, but if some dry woolen material like a shawl were placed over the clothing the strength of the application could be conveniently graduated by the number of folds of the shawl. He did not use the insulated platform but allowed the patient to sit in a chair upon the floor, and used the negative pole of the static, either in connection with the gas fixture, or, if this were too strong, allowed the chair to remain upon the pole itself. By these means he could very accurately adjust the strength of the application with the massage roller to the most sensitive patient, or to the most robust and phlegmatic. He felt absolutely sure that Dr. Snow's statement concerning the electrical treatment of acute diseases would stand the test of time. He had repeatedly used the negative current in such cases, and had yet to see a case which had been made worse or which he had lost from the use of it. He was satisfied that we had not reached the end of the wave theory yet.

Dr. Snow expressed his thanks for the kind reception accorded his paper. In a paper which he had published in the Journal of Electro-Therapeutics for August he had discussed this subject exhaustively. He would not in cases of acute rheumatic fever exclude the salicylates which give so generally good results. The cases that he had referred to were those in which in spite of the rheumatic fever the attack had become more or less localized in a few joints. Dr. Morton's cases were exceedingly interesting, and showed that electrostatic

treatment would eliminate from the system those substances which are vaguely spoken of as "the rheumatic poison." Enough time should be allowed to secure a proper result in individual cases. One should not expect to get this effect in every case in ten or fifteen minutes. Again, there was a marked difference between a spray and a brush discharge, although it was difficult to describe this difference. He used wooden electrodes, of soft maple, for the brush discharge, and took care that they were kept moist, but not wet. Within the past year his attention had been directed to this particular modality. It took time when applying the brush discharge to get the desired effect; moreover, there was a singular difference between the positive and negative—he meant the current of negative insulation and of positive insulation respectively. With the positive current were associated a number of green rays obtained when using the wooden electrodes. The sedative effect was obtainable with the negative, while the positive was painful and irritating. The machine should be run at a high speed when employing this modality if a marked effect was sought. The chain should be snapped at the end of the handle in order to avoid the possibility of a spark jumping directly to the patient. In his experience such a mode of administration had never failed to relieve cases of acute rheumatism. The patient should, as a rule, receive daily administrations until cured.

The painful condition to which Dr. Bishop refers from administration of static currents can only involve the static induced current. If the wave current was employed, and it was that current he used, it was always possible to make the spark-gap short enough at first to cause little or no pain, and then as sedation was induced it should be gradually increased. No current, certainly not a powerful constant current, produced so little discomfort in acute conditions as the wave current properly administered.

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#### THERAPEUTICS OF DRY HOT AIR.

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CONN.

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#### CHAPTER IV.

##### RHEUMATISM.

By this term is meant true inflammatory rheumatism. In the course of an article upon dry heat as a therapeutic agent

published in the New York Medical Journal for December 2, 1899, the author after discussing the unsatisfactory results, in many cases, of ordinary anti-rheumatic measures, made use of the following expression : " My experience with hot air, however, has led me to believe that we are about to turn a new leaf in the history of rheumatic treatment," etc., and subsequent experience has justified the inference there expressed. It is in this disease that the agent has won its most enduring laurels up to the present time. Its mode of application and the results therefrom are now well defined, and the treatment of the disease has reached a point where it is no longer a reproach to the profession. Instead of being involved in a mist of uncertainty and doubt, it can now be as satisfactorily and positively cured as any other disease, not excepting malaria.

One of the most important points to be taken into consideration in judging of the efficacy of hot air or any other element of treatment in this disease, is the very common error of diagnosing as rheumatism conditions due to entirely different causes. The frequency of the error may be appreciated when I say that at least three-quarters of the cases that have come under my observation with a diagnosis of rheumatism have not been rheumatism at all, and further have involved the practical point that they are disease processes which do not respond to anti-rheumatic therapeutics.

This makes the correct diagnosis of a condition presenting rheumatic phenomena of the first importance, and as anti-rheumatic treatment is not only futile, but positively injurious, in some other conditions closely resembling the disease, the diagnosis should be made before treatment is instituted. Rheumatism has been made to bear a vast deal of undeserved opprobrium. As this is not an article upon diagnosis, I will not dwell upon the point further here, but will say that the diagnosis can usually be made at once.

The more important conditions from which it is to be differentiated are as follows : Arthritis deformans, neuritis; neuralgias, myalgias ; tubercular, syphilitic, gonorrhreal, and traumatic osteitis; periosteitis; synovitis; phlebitis; and non-rheumatic myositis, which is of rare occurrence, but sometimes offers a problem puzzling in the highest degree. Pressure from tumors, especially those occurring multiple in the lymphatics in front of the spinal column in the lower medi-

astinal, upper-abdominal, and intra-pelvic regions, and which involve the nerve trunks and plexuses in these vicinities, orthopedic deformities,—as flat-foot,—and occupation neuroses in their earlier stages, deserve a much greater amount of consideration in this connection than is generally accorded to them.

The two first-mentioned diseases cause by far the greatest number of diagnostic errors, and it is in these also that early diagnosis is of great importance, as will be seen when their respective treatments are discussed.

It is necessary to divide rheumatic cases into but two classes for therapeutic purposes—acute and chronic. If the acute stage is properly and thoroughly managed there will very rarely indeed be any chronic stage to consider; but this could not have been affirmed before the advent of hot air. The cause of chronicity has mostly resided in the impairment of local and general metabolism through the influence of long-continued pain and the long-continued presence in the blood of rheumatic toxines, by reason of which it became impossible for the remedies ingested to be assimilated effectively by the tissues wherein the pathological focus existed. Hot air, through its power of relieving stasis and stimulating sluggish metabolism, renders rapid and effective the assimilation of the appropriate remedies, the general trophic centers are not subjected to drug, pain, or unendurable toxine depression, and recovery is rapid and satisfactory.

It is hardly necessary to state that other pathological conditions which may exist when an attack of rheumatism is sustained should receive attention. Sometimes the system is so depressed by these that the rheumatism cannot be removed until they have been attended to. I once had a patient under treatment for rheumatic poly-arthritis for three weeks, and was able to secure only temporary benefit. At last I discovered that she had a tapeworm, a fact of which she had previously had not the slightest suspicion. After the removal of an eighteen-foot parasite her recovery was immediate and perfect.

## THE TURKISH BATH.

BY CHARLES H. SHEPARD, M. D., BROOKLYN, N. Y.,  
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It is well to remember men who have added to the store of human comfort and helped to alleviate some of the miseries of mankind. Such a man was David Urquhart, an enthusiastic Englishman, an extensive Oriental traveler and writer, at one time a member of the British Parliament, and again the foremost promoter of the hot-air bath, named by him the Turkish bath, which is now daily challenging the attention of the medical man. Its increasing popularity among the laity, which is a matter of congratulation for all who would aid in sanitary reform, at the same time calls for thoughtful action by the profession. If it is to be permanently identified with the life of our people, which seems to be the tendency, there will necessarily be much in it of great practical importance to the scientific physician. Hot air as a therapeutic measure is older than the time of Hippocrates, who identified himself with its use. During the prosperous times of the Roman Empire it became one of the most popular institutions of the day. The many ruins now standing throughout what were once but provinces of Rome attest its extensive employment at that time.

The fact that the general principle underlying its use has been utilized in all countries, and at all times since the dawn of history, by the aborigine as well as the highly cultivated, is most interesting as establishing its universal applicability.

No new theory is propounded; on the contrary, it is simply what has been known, though imperfectly practiced, for centuries. Air, water, and temperature are the most salutary and unfailing agents for the correction or alleviation of the numerous derangements to which life is exposed. In the hands of its modern advocates the Turkish bath has met with varying fortunes, according to the skill or merits of its promoters, and it is most desirable that the scientific mind should rescue it from whatever pertains to charlatanry. Its use as a therapeutic measure naturally comes within the province of the medical profession, and if there follows even a fraction of the benefit claimed by its enthusiastic advocates, the community will have occasion to be thankful.

Its action in rheumatism and some of the neuroses, as well

as blood poisoning, has been marked by many successes. It has proved of great service as a means of rest and recuperation to those who are suffering from the everyday pressure of overwork. But the larger field for this bath will probably come in the line of preventive medicine. There is little doubt that our people will gradually become educated to the legitimate use of this bath, and that it will ultimately be largely adopted by them as a habit. It will supply a much-needed want, by increasing our sanitary resources, helping to lift all to a higher plane of health, and the physician to a higher standard of work.

A most desirable and convincing method of promptly testing this would be by placing well-equipped Turkish baths, in charge of someone practically conversant with its processes, in some of our asylums and hospitals. It is a lamentable fact that bathing facilities in those institutions are, as a rule, not of the most desirable kind.

It is well to guard against any immature conclusions. At the same time, those who have experienced the feeling of vigor and elasticity arising from the proper use of this bath will be inclined to pardon the enthusiasm of its votaries. Opportunity, tests, and time will surely reveal all of its lasting virtues, and it is always wise to range ourselves on the side of cleanliness and purity. It was Dr. Andrew Combe who said: "We ought to extend the hand of welcome to everyone who is able to correct an established error, or add a new truth to the existing store ; and much more so, if the offered contribution should be of that new and important principle capable, if true, of modifying and improving the whole field of medical practice."

There is a moral obligation resting on all who have intelligence and opportunity, to become acquainted with the laws of health, and live in obedience to them, and also to gain a knowledge of the simple and natural agencies by which deviations from the normal standard can be corrected. When once this knowledge becomes general there will be a vastly smaller field for any form of quackery, and the too general use of patent medicines will be dispensed with. None are better qualified than medical men to lead in such a reform, and in no more noble work can one engage than that of teaching people the Science of Life.

## Editorial.

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### THE X-RAY IN MALIGNANT DISEASES.

THE X-ray as a therapeutic measure has steadily grown in favor during the past two years, and it is now announced without a possible doubt that a new remedy is provided for the certain relief of a class of sufferers who until now have perished annually by scores. At first it was sought to destroy the malignant tumors by inducing a local dermatitis, which would destroy the tissues involved and those immediately surrounding the infected area. Later it was discovered that cases were successfully treated without causing the otherwise dreaded dermatitis—or so-called X-ray burn.

The fact that tubes of low vacuum were known to be most instrumental in producing destruction of exposed tissue naturally led to the selection of such tubes in the first instances, and has been very generally advocated until quite recently. Drs. Clarence E. Skinner and Arthur Barry Blacker, B. S., have advocated tubes of high resistance, and we believe that the former has established a precedent for the employment of the high tube, for we have seen the report of no case of equal extent, completely healed over and apparently cured in so short a time, as the case reported in the February number of this journal. If the high tube can be shown to be uniformly as good, or better, it should be employed, because it is also safer.

It has been said by some writers that special coil apparatuses were essential, and that static electricity was not suited to the treatment of lupus and malignant disease. This, too, has been disproved in the case to which reference has been made, as well as in the practice of other observers.

The way that the rays affect the process is a subject upon which many theories have been advanced. Whether due to a specific action upon a probable microbe, a change in the process of cell proliferation, over-development and attenuation of a germ, electric vibration, or some other cause, one thing is certain—that the tumors and ulcerations disappear

through the instrumentality of the painless exposure to the X-ray.

That no definite technique is universally established as to frequency, distance, time of exposure, quality of tube and the apparatus which excites the tube, and that some diversity of opinion exists, would denote that there is much to be determined by future investigation.

That the X-ray causes the disappearance of carcinoma, sarcoma, lupus, and many skin affections by various methods is significant. That it is now indicated in all inoperable cases of malignant disease because it offers one more chance, is soon to be acknowledged by all surgeons.

That if it proves uniformly successful in inoperable cases, it cannot be long before it supersedes the knife in very many, if not all, cases is certain.

The above observations, based upon positive results in the hands of excellent authorities, cannot be ignored. Already there is promise of success in abdominal cases and bone sarcoma. A wide field is open for research and investigation, and only time and careful study can determine its limitations and scope of application.

It is a work worthy of the best endeavors of the profession, and the co-operation of such as have means with which to aid in the march of progress.

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### **PHYSICAL THERAPEUTICS IN TUBERCULOSIS.**

THE best evidence of the inefficiency of medicinal measures directed to the immediate destruction of the bacillus tuberculosis is that after years of experience devoted to the various plans of drug treatment, the profession has failed to establish a uniformity of method in which authorities concur. Since the first attempt, and lamentable failure, of Koch to produce a serum that would destroy the germ, many other futile attempts have been made. Already many who have advocated the use of serum therapy in the treatment of consumption have abandoned it. Others, however, persevere, and certainly it is to be hoped that their labors may be crowned with success, as has been that of antitoxin in the treatment of diphtheria. The influences of climate, diet, out-of-door life, correction of habit, tonics and measures which by improving metabolism promote the powers of resistance, have contributed to the cure

of very many cases, and are universally recognized as essential to the successful management of the disease. Many others reported as cured by various measures have undoubtedly derived much from the co-operative influences of good hygiene and proper feeding, which in judicious hands must figure as the basis of whatever plan.

The other forms of physical therapeutics act in full accord with the rational treatment—promoting tissue change, increasing the activity of secretion, excretion, and the appropriation of ingested pabulum, and thereby greatly increase the patient's prospect of recovery; for whatever plan of treatment is adopted, it must quicken the natural activities, and not retard function. High-potential electricity—currents of great voltage and small quantity, induced from either a static machine or a suitable coil—is rapidly coming to the front in the treatment of tuberculosis. We are safe in predicting much from the employment of electricity in the future.

**Phototherapy.**—The use of the Finsen light, incandescent or arc light, baths, and other methods of administering light in the treatment of the disease, has recorded results in its favor from authorities whose statements and judgment cannot be questioned, and therefore demand consideration.

**Radiotherapy.**—The X-ray in the treatment of lupus vulgaris has demonstrated its potency in destroying the bacillus when present in superficial lesions, and there are already a sufficient number of cases of local joint affections recorded to warrant the expectation at least that more will be accomplished in this direction when a definite method is established. Some favorable results are reported from exposures of the chest to the X-ray, but so little of a definite character has been published that it can only be suggested that there are reasons to hope something from an agent so potent and penetrating.

Ozone from natural sources has long been supposed to exert a favorable action in the cure of consumption, but results from inhalation in quantities derived from electric discharges have often been found unsatisfactory because of irritation (probably due to the nitrous acid produced). Under favorable conditions, however, there is undoubtedly much to be accomplished with an agent so potent in destroying the bacilli.

Hydrotherapy, when judiciously employed, is of undoubted value in the treatment of the disease.

Pulmonary gymnastics and active exercise in the open air as a prophylaxis, or in incipient phthisis, have long been recognized as valuable accessories.

Not to one measure alone, but to a combination of the forms of physical therapeutics, judiciously adapted to the indications of each case the profession is bound, we believe, in the future to turn as indispensable for combating this scourge of humanity.

## Progress in Physical Therapeutics.

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### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

A NEW FIELD IN ELECTRO-THERAPEUTICS.

THERE is no question but that a practically new field has been opened in electro-therapeutic medication by the introduction of mercuric diffusion in connection with the older forms of so-called metallic electrolysis, in which anodes of copper, zinc, iron, etc., were caused to be changed electrolytically into the oxychlorids of the metals, and the latter diffused within diseased tissues. It is to Gautier, of France, that we owe the revival of this use of "soluble electrodes," its laboratory study, both from the points of view of the exact chemical compounds produced and their diffusion within living issues, and the value of this procedure in gynecology. The subject was quickly taken up in America by Morton, Cleaves, and Goelet, and a most thorough and interesting review of Gautier's conclusions was given by Cleaves, supplemented by her personal studies in a paper read before the American Electro-Therapeutic Association in 1893.\*

While the practical results derived from these methods, which were so well described in this paper, were very considerable, it is quite possible that the apparent failure of the soluble anode to displace Apostoli's unattachable anodes in gynecology was due to two shortcomings of the latter—they were liable to become attached to the mucous membrane of the uterine cavity in gynecology, thus producing slight traumasms on their withdrawal; the site of the diffused chemicals, moreover, was liable to become temporarily deflected by reason of the very feeble antiseptic powers of the latter.

These objections are both eliminated by the improvement in metallic diffusion first suggested and employed by one of the

\* Trans. Amer. Electro-Therap. Assoc., 1893, p. 91.

editors of this department, in which metallic mercury is invariably associated with the diffused metal, by merely amalgamating the electrode, the result being a diffusion of the mixed oxychlorides of both metals, the mercury usually in greater proportion, leaving a sterilized application-field that at times remains sterile for weeks after a single application, and permitting the still lubricated instrument to be withdrawn without the slightest adhesion having been formed to the tissues acted upon. Aside from these important results, this modification adds also the immensely valuable "resolvent" and "alterative" action of mercuric salts diffused interstitially within the diseased structures. A further modification was the introduction of pure mercuric interstitial diffusion from mercury held in contact with pure gold electrodes, this form of application being most desirable when a considerable destruction of tissue was to be avoided.

The value of these modified proceedings in gynecology is so great that some gynecologists now rarely employ any positive galvanic pole within the uterus unless it is freshly coated with quicksilver, and as platinum cannot be amalgamated, the baser metals are preferred for the electrode.

Aside from the employment of mercuric cataphoresis in gynecology, its field of usefulness may be said to include the possibility of curing many affections characterized by reasonably external foci of infection, such as tuberculosis and cancer, or abnormal secretory membranes, such as cysts, chronic abscesses, sinuses, etc.

Given a localized deposit of extrinsic germ life in any accessible portion of the body, the question of cure by destructive sterilization may therefore be said to be reduced to the practical details of a problem in electro-chemical engineering, the electric action, as it is converted into chemical and cataphoric action, being so easily gauged by the eye as to permit the results to be immediate and positive. Were it not for the differing vitality of the germ life of these local invasions, and the fact that we are dealing with living beings, enforcing medical and surgical circumspection, the problem would not differ greatly from that involved in electroplating utensils, or the electrolytic manufacture of caustic soda and chlorine from sea-water.

*Technic of Mercuric Cataphoresis in the Cure of Tubercular Deposits in Lymphatic Glands.*

The instruments needed in this method are exceedingly simple and inexpensive, granting the previous possession of a galvanic battery, meter, and controller, or proper controlling mechanism of the Edison current, and the results attainable will almost invariably be a radical cure of the tuberculosis and restoration of the patient to health, leaving a scar not larger than a pin-head in cases in which the skin was unruptured. The only exceptions to this favorable prognosis are cases in which the affected glands are too deeply situated to be reached either directly or by indirect regional sterilization.

The initial application is made with a needle of zinc, made by cutting a sliver from a sheet of thin zinc, such as used by stove-dealers, a pair of long-handled surgical scissors answering very well for this purpose. The sliver is about 2 1-2 inches long, tapering from 1-8 inch in width at the base to a sharp point. About the blunt end a piece of No. 28 copper magnet wire, with bared ends, is twisted, and firmly attached by bending a little of the zinc over the wire with a pair of pliers. This completes both the electrode and conducting wire, the fine wire being much more convenient than a heavier cord. Before amalgamating the tip it may be filed to a very sharp point to facilitate insertion. It is then dipped in weak acid and then in quicksilver, and when rubbed on wet cotton will be found to be heavily coated with mercury. As the object of the first application is to make an open sinus into the diseased gland, this instrument is not insulated.

Having attached the other end of the conducting wire to the positive pole of the battery and placed a negative dispersing pad in position on some indifferent body surface, the patient reclining on a couch, the skin over the enlarged gland is chilled with a kelene spray, and a slight opening made through the skin with a narrow bistoury. Into this opening the amalgamated tip of zinc is inserted, a drop of saturated solution of cocaine placed about the opening, and one to three milliamperes turned on and maintained for ten minutes.

The first application is usually the only one that is painful, but the pain produced is scarcely enough to warrant Schleich injections. As a result a little plug of necrosis extends into the gland, which comes away in four or five days, leaving an open channel for the amalgamated gold instrument, which is thereafter employed twice or three times a week.

The gold instrument is made from a piece of 18-karat gold wire, No. 14 or 16, about 2 1-2 inches long, with the active end rounded and the other end bent into a small loop, through which the conducting wire is threaded for attachment. The shank of this instrument is smoothly coated, while hot, with fused shellac, excepting about a quarter of an inch at the tip,

which is to be well coated with mercury on each occasion before use.

Before inserting this gold-mercury electrode, or any insulated zinc-mercury instrument used after the first application, the edge of the sinus should be deprived of sensation by a two-minute cocaine cataphoresis from a pledget wet with the saturated solution, the electrode used for the purpose being preferably platinum or carbon. The active electrode may then be inserted painlessly.

The strength of the gold mercury applications should be from three to ten milliamperes, their duration about ten minutes, and they should be repeated two or three times a week.

Between treatments the opening may be covered with a bit of gauze held in place by a piece of zinc-oxide plaster. No apprehension of infection need be felt, as it is an impossibility for germs of any kind to exist or find lodgment under the conditions given, the mercuric oxychlorid produced from one five-milliamperes application of ten minutes—which, by the way, will denude an eighth-inch tip completely—sterilizing the cavity for about a week.

As the applications proceed the sensitiveness is apt to increase, the physiologic resistance of the part being increased. The diffused oxychlorid devitalizes the tubercular colony gradually, the debris either being discharged or absorbed, and in a few weeks the sinus produced may be allowed to close from the bottom, leaving normal tissue and a scar so small as to be but slightly observable. It is thought that a mild sterilization is produced in glands situated below the one operated upon, through conveyance of the deposited chemicals by the lymph channels.

In two cases of tubercular glands of the neck, reported by one of us to the Philadelphia County Medical Society,\* complete cures resulted. Since that time equally good results were attained in the case of a child, yet unreported, where, however, owing to the tender age of the patient and the large size of the tubercular abscess encountered, it was necessary to administer chloroform and employ as much as fifty milliamperes on two occasions. Each of these patients made a perfect recovery from the affection, and the glands that were not opened at the time of treatment showed scarcely perceptible scars.

[G. B. M.]

\* Proc. Phila. County Med. Soc., February, 1901.

**EYE, EAR, NOSE, AND THROAT.**

EDITED BY W. SCHEPPEGRELL, A. M., M. D.

***Treatment of Stricture of the Lachrymal Duct by Electrolysis.***

This subject was introduced by Dr. L. L. Mial, of New York City, before the last meeting of the American Laryngological, Rhinological, and Otological Society (Laryngoscope, November, 1901). He stated that he found silver the best metal to use, and preferred to place the positive electrode on the wrist.

As a stricture is never the whole length of the canal, it is a matter of much importance to apply the current only to the narrowed portion. He uses the volt selector, amperemeter, and a rheostat, with the Edison 110-volt current. Anyone can satisfy himself of the relaxing effect of the current by introducing an instrument which is tightly grasped by the tissues, and then noting how easily it passes after the treatment has been applied.

Each séance should last from thirty seconds to three minutes, and several illustrative cases were reported. The author claimed that electrolysis is harmless, if used properly; that it is antiseptic in its action; that it is much less painful than the usual mode of passing the probe; and that it dissolves and relaxes the strictures much better than any other method, thus diminishing the danger of tearing the mucous membrane and making false passages.

In the discussion of this subject Dr. N. L. Wilson stated that he had also had good results from this procedure, having been led to try it after having seen the good effects from the electrolytic method in stricture of the eustachian tube.

In closing the discussion Dr. Mial further explained that he had used the electrical probe in both the upper and lower canaliculi, but for stricture of the lachrymal duct he always used the lower canaliculus, and the great advantage of the electrolytic method was that one could easily dilate to No. 5 or even No. 8. When an insulated electrical bougie of such size could be introduced the result was exceedingly good, and was obtained without risk.

***Ozena and Its Treatment.***

In a careful résumé of the various treatments advocated by the authors who have written on this subject, Bouroulec (*Gaz. des hôpits.*, No. 108, September, 1901.) considers that electrolysis is the most effective treatment for ozena.

***Removal of a Foreign Body from the Trachea by Means of an Electro-Magnet.***

Garel of Lyons (*Internat. Centr. f. Laryngol.*, etc., vol. xvii, No. 7, *The Medical Age*, October 10, 1901) reported to the

Society of Medical Sciences of Lyons an interesting case. A child, twenty months of age, swallowed a nail. After a radiographic examination tracheotomy was performed. Instead of the usual cannula, a two-bladed dilator was employed to keep the trachea opened, and a very strong electro-magnet was held a short distance from the tracheal opening. The nail sprang toward the magnet at once, and was very easily removed. This observation is doubly interesting because it calls attention to two physical methods brought to the help of medicine, viz., the diagnosis by means of the radiograph, and treatment by means of the electro-magnet. This report of Garel's case led to a discussion regarding the application of the electro-magnet in general in the extraction of metallic foreign bodies. Aurand explained that in his clinic a very strong electro-magnet, made by Haab of Zurich, is used. It is designed chiefly for the extraction of pieces of steel or iron from the eye, and one need only bring it within a few centimeters to have the bodies drawn forward by the magnetic attraction.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

THE profession now runs to the other extreme in using the Bottini operation. The method neglected for more than twenty years takes now a prominent part in the operations upon the hypertrophied prostate. An original article appeared in the Journal of the American Medical Association of January 11, 1902, by Hugh H. Young, M. D., of Johns Hopkins Hospital, Baltimore, on a "New Combined Electro-cautery Incisor for the Bottini Operation for Prostate Obstruction." His statistics are 752 cases, in which the result was good in 86 1-2 per cent., with a failure in 7 1-2 per cent., and the mortality between 4 and 6 per cent.

He finds several weaknesses in the modification instrument of Freudenberg, which he describes. He describes his new instrument, which modifies some of his objections to the Freudenberg instrument.

Other articles on the same subject will be found in the Medical Record, January 4, 1902, as follows : "The Pathology and  $\text{\AA}$ etiology of Prostatic Hypertrophy and Suprapubic Drainage as a Method of Treatment," by Dr. A. C. Bernays of St. Louis, Mo. Next comes "Suprapubic Prostatectomy," by Dr. C. H Mayo of Rochester, Minn., and the

"Indication and Limitation for the Bottini Operation," by Dr. Louis E. Schmidt of Chicago, who read a paper with this title.

Most surgeons are now favoring the Bottini operation, but some are still against it. Of the latter may be mentioned Dr. John A. Wyeth of New York, who read a paper before the New York State Medical Association, in which he remarked that "it was scarcely a less scientific and justifiable procedure than the deplorable operation of Bottini, which consisted in the electrical cauterization and partial destruction of this organ by means of a specially devised apparatus" (New York State Journal of Medicine, January, 1902, p. 19). Other papers on this subject are, in the Medical Record, December 28, 1901, by Ramon Guiteras, on "Clinical Report of a Second Series of Twelve Cases Benefited by Bottini's Prostatectomy." Other interesting essays have appeared in the New York Medical Journal, December 28, 1901, by Prince A. Morrow, M. D., on Report of the Committee of Seven of the Medical Society of the County of New York on the Prophylaxis of Venereal Diseases in New York City. In the Medical Record of December, 28, 1901, an article by Frederic Bierhof, M. D., on "The Rôle of the Prostate Gland in Gonorrhea," which is recommended for perusal. Next we mention in the Annals of Surgery, Philadelphia, for December, 1901, a paper on "Stone in the Bladder of a Female Child of Four Years," by Miles F. Porter, M. D.

At the meeting of the Southern Surgical and Gynecological Association, held in Richmond, Va., in November, 1901, the following papers were read : by Dr. F. W. McRae of Atlanta, on "Suprapubic Prostatectomy," and by Dr. A. H. Ferguson of Chicago, on "Median Perineal Prostatectomy." Both papers were published in abstract in the Journal of the American Medical Association of November 30, 1901.

Two new instruments have been devised for the catheterization of the ureters : one by Bramford Lewis, M. D., of St. Louis, and the other by Dr. Frederic Bierhof of New York. The latter was demonstrated at the meeting of the German Medical Society, New York, on January 6, 1902. Dr. F. Bierhof has also improved the Leiter-Nitze cystoscope, which permits the use of instruments while the bladder is well illuminated by the electric light.

We find in the Medical Record, January 18, 1902, "Supra-

pubic Cystotomy in Operations upon the Prostate," by Howard Lilienthal, M. D., of New York. The author in conclusion says : "If the prostate is very soft and hyperæmic, or if it is of such a texture that it cannot be enucleated, one has the choice of galvano-cauterization through the urethra (Bottini), through the perineal wound, or of removal with the cutting-forceps by conjoined manipulation. In any case, the suprapubic wound will be of great service. Its disadvantages I believe to be greatly exaggerated. The operation of opening the bladder from above is quick, simple, and in my experience accompanied by little shock. The mere cystotomy is far less bloody than the usual perineal section. When speed is the all-important element, as it frequently is in old persons, it must be remembered that the cystotomy takes only a few moments. The entire operation, with removal of the prostate, is finished in from fifteen minutes to half an hour."

In Merck's Archives for November and December, 1901, appears an article on "Neurasthenic Urethritis: its Preventive and Curative Therapy," by J. M. Thompson of Boston. The author of this paper says : "The sheet anchor of the physician in respect of local therapy is stripping, for by no other means can the prostatic and vesicular deposits be removed ; and so long as such deposits are allowed to remain, the peripheral termini of the nerves so abundant in the prostate and vesicles will of necessity be kept in a state of constant irritation. Stripping serves (1) to remove the pathological deposit located in the prostate and vesicles ; (2) to relieve the congestion caused by the deposit ; (3) to promote absorption and improve the circulation, so long hampered by the pathological deposit ; (4) to restore the tonicity to the parts—impaired to a varying degree. Stripping in reality is a form of massage, a term which some authors prefer." The use of electricity is mentioned.

The St. Louis Courier of Medicine for December, 1901, brings an article on a Report of Work in Ureteral Catheterization in the City Hospital the Past Year, by H. L. Nietert.

In the Lancet of December 4, 1901, appears an interesting article on "A Case Illustrating the Effects of Pressure on Early Syphilitic Growths." Basing his opinion on clinical observation, A. Shillitoe believes that (1) pressure, as seen in the case of a phimosed prepuce, and (2) no pressure at all, as in the posterior third of the dorsum of the tongue, exert an equal influence in determining the formation of ordinary-look-

ing papillomata ; whereas, if the pressure be intermittent, as seen in the anterior two-thirds of the tongue, the inner aspect of the thighs, and the sides of the scrotum, or in the natal fold, then these papillary hypertrophies assume a condylomatous form. [R. N.]

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## CLINICAL BACTERIOLOGY AND MICROSCOPY.

BY ARCHIBALD M'NEIL, M. D., NEW HAVEN, CONN.

THE field of usefulness of the microscope as an aid in diagnosing pathological conditions has been so enlarged and developed during the last decade that it has become a practical necessity for the up-to-date physician to have at least a sufficient knowledge of clinical laboratory methods to enable him to procure intelligently such specimens as he may wish to send to a laboratory for examination. To do this he must be familiar with the methods followed by the microscopist in making the examination.

Some physicians find pleasure in making their own examinations, but the great majority of doctors have neither the time to devote to laboratory work nor do they care to incur the expense of fitting up a laboratory. In a large number of cases where the results of bacteriological or microscopic examinations prove unsatisfactory, the fault lies with the physician who procured the material or culture to be examined. If the physician does not know just what material is required for an examination, and just how to procure it, he cannot expect to obtain a report that will have much diagnostic value.

It will be the aim of this department of the journal to keep in touch with the current events and literature of the microscopical world, and to bring out such points in clinical bacteriology and microscopy as will aid the general practitioner in his everyday work.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

IT is impossible to comprehend in the department of dermatology the scope carried by X-ray therapy, as the subject now presents itself. The action of high tubes is evidently such

that the field is no longer limited to epithelial structures, but already in the experience of advanced workers it seems to be demonstrated that abdominal cancers and osteo-sarcomas are remarkably susceptible to X radiance from high vacuum tubes.

That every opportunity may be afforded to advance a subject of so great importance, it is thought best to add this department to the journal, and use every means to publish the progress of the subject.

[E. D.]

### ON THE EFFECT OF X-LIGHT FROM HIGH VACUUM TUBES IN INTRA-ABDOMINAL CANCER.

BY CLARENCE EDWARD SKINNER, M. D., LL.D.,  
NEW HAVEN, CONN.

IT is generally believed that internal cancer is not susceptible of the beneficial influence exercised by X-light upon the superficial forms of the disease. The writer's experience up to the present time leads him to believe that the lack of benefit hitherto observed has been due to the fact that the common practice is to apply X-light to malignant growths from low vacuum tubes, which do not produce rays of sufficient penetration to reach the deep tissues which are affected. With a good high vacuum tube, one that forces back a spark-gap of not less than four inches, rays can be produced that penetrate clear through the body; hence a malignant growth in their path cannot fail to be penetrated by them and influenced by them if X-light is capable of exerting influence. The writer holds, therefore, that in treating cancers that extend more than three-quarters of an inch below the surface of the skin a tube giving rays of high penetration should be used, and for superficial growths either a high or low tube indifferently. At the present time he has not been able to convince himself that a high degree of penetration is important when the cancer is superficial.

The writer believes, and has always believed, that the beneficial influence which X-light undeniably exercises upon superficial cancer is due to the X-ray vibrations acting upon the cell elements of the growth, which elements are too weak and lacking in vitality to reach maturity, and become the specialized tissue for which they were destined of themselves, in such a way as to give them new vitality and hence ability to reach maturity and their normal ultimate structure. He does not consider the effect to be due to ozone formation, electrification, or electrolysis of the elements of the growth, the deposition of nitrous acid upon the sore, or any other of the ingenious, but in many cases far-fetched explanations which have been advanced to the exclusion of a specific influence of X-light. We have used all these agents before, but they did not cure cancer until X-light came upon the scene.

The writer has now under treatment by X-light five cases of intra-abdominal cancer which will be reported later in full. The results secured so far, however, warrant bringing them to the attention of the profession, and the hope that other operators will be encouraged thereby to attack the disease in this situation by this means. In all of these cases tubes of from four to eight inches spark resistance have been used, the anode from eight to ten inches from the patient's skin, and the treatments last from fifteen to twenty minutes.

**Case I.**—Carcinoma ; diagnosis microscopically confirmed ; situated originally in the cervix uteri, and recurrent after two operations, the last one being an hysterectomy and ovariotomy. When the patient came under treatment six weeks ago there was a tumor in the cicatrix in the anterior abdominal wall as large as a small orange, and an ulcer in the vaginal vault and anterior wall, starting from the cicatrix, as large as a silver dollar. Other small tumors were palpable in the abdominal cavity. Patient suffered severe pain constantly ; there was profuse bloody purulent discharge from the vagina, and, of course, the condition was one of hopeless, helpless misery.

The first X-ray application markedly relieved the pain and soreness, and the patient slept well the night following for the first time in many weeks. After the fifth treatment patient was able to stand erect upon her feet for the first time in eight months. Since the sixth treatment there has been no pain, the large tumor mentioned above has decreased to the size of an English walnut, the other smaller tumors in the abdomen have disappeared, the ulcer in the vagina has decreased to the size of a dime, and the bloody purulent discharge has become only a trace.

**Case II.**—Carcinoma of the cervix uteri, vaginal wall, bladder, and probably other structures, with a perforation into the bladder, so that all urine passes through the vagina. Patient has had seven treatments. Pain, which had been excessive, was relieved after the second treatment. The bloody purulent discharge began to lessen after the second treatment, and is now reduced to a small stain upon the pads four or five times daily, and shows almost no bloody discoloration. Patient is now sleeping well, eating splendidly, and has gained greatly in strength.

**Case III.**—Fibro-sarcoma ; diagnosis microscopically confirmed ; recurrent after total extirpation of uterus and ovaries for the growth which originally involved the uterus. Inoperable. Diameters of tumor are, laterally, ten inches ; vertically, eight inches ; and antero-posteriorly, six or seven inches, as nearly as can be judged. When patient came under treatment the growth was of a stony hardness throughout. She has been treated three times, and the tumor has become markedly softened to a depth of over an inch, as nearly as can be judged,

and the skin has become freely movable over all the area that has been rayed. Sensations of pressure and discomfort are greatly lessened, and patient expresses herself as feeling well. She has never suffered pain.

Case IV.—A nodulated abdominal tumor, probably sarcomatous, in the lower lumbar and upper sacral regions. Inoperable. Pain was present before treatment in the small of the back and in the right sciatic nerve, and exquisite tenderness in the tumor upon deep palpation. She has been treated twice with resulting complete disappearance of the sciatica and marked lessening of the backache, but no change is as yet observable in the tenderness upon palpation of the tumors, or in their size.

Case V.—A growth in the neighborhood of the left broad ligament, said to be malignant and inoperable by a surgeon who did an exploratory laparotomy, but no microscopical section was made. It is accompanied by an ascites that accumulates very rapidly after tapping, to the extent of two and three gallons. No pain is or has been present, only exquisite tenderness upon palpation. This patient has been treated three times, but as yet no change of any kind is observable.

The evidences of improvement in the local lesions demonstrable by examination, the relief from pain, and the apparent improvement in the general condition lead me to hope that some permanent benefit may be obtainable ultimately in some of these cases. But even if lives are not prolonged thereby, I consider the comfort which the victims derive from the relief of their pain to be an imperative indication for the employment of X-light in this disease. We thereby secure a condition of euthanasia unattainable by any other measures. As stated previously, these cases will be reported in full later, whatever their terminations.

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*The Pathological and Therapeutic Aspects of the Röntgen Rays.* By Carl Beck.

In the Medical Record of January 18, 1902, he describes three types of degrees of burns. "The first is characterized by hyperæmia, infiltration, increased temperature, exfoliation in small scales, associated with a tormenting itching. It seems that there is a regressive metamorphosis (atrophy) of the differentiated elements of the skin, viz., glands, hairs, and nails. The main feature of the second degree consists in the formation of blisters—the inflammatory signs are well pronounced, the tension considerable, and the pain intense accordingly. After the blisters are removed the corium is exposed as a red and sore surface—bullos form of Röntgen-ray dermatitis. The third and gravest degree is characterized by the escharotic destruction of the irradiated tissues. They show

the signs of dry gangrene, and appear brownish black. If they exfoliate by a slow suppurating process, or if they are removed, as they should be, by surgical interference, a granulating ulcer remains, the cicatrization of which may take months—the necrotic form of dermatitis."

The writer states that idiosyncrasy has not been proved, but that blond individuals seem from his experience to be predisposed. Some parts of the body seem to be more susceptible than others, but all parts are susceptible ; even internal organs may be affected if the powerful influence lasts long enough.

He considers at length the pathological structural conditions.

Irradiation has become the treatment *par excellence* for large-haired surfaces. Since the cure of sycosis is mainly dependent upon most thorough depilation, the beneficial influence of the rays can well be appreciated. Favus, eczema, psoriasis, rosacea, acne, vulgaris, and prurigo are also amenable to treatment with Röntgen light.

Lupus was first cured in 1897 by Huemann and later by others. He reports a case of his own which has now remained cured for three years. Lupus vulgaris was cured under the administration of moderate energies, after a small number of exposures of not longer than five minutes. "In lupus erythematodes irradiation must be continued for greater length of time than in the case of lupus vulgaris. Successful treatment of nævus vasculosus is also reported."

In epithelioma of the lower eyelid and of the cheek he has also obtained a perfect result after a few treatments. In spite of this result he still regards extensive removal the proper treatment. Recently he has seen marked improvement in a case of sarcoma.

In regard to the technique for therapeutic purposes careful individualization is the condition sine qua non. Some patients react soon, some after many exposures, and some not at all. "It should be regarded an iron-clad rule to stop the exposures as soon as the patient feels a burning sensation." Exposures are made for from five to forty-five minutes, and may be repeated every second day, or even every day in obstinate cases. For the treatment of most skin diseases, however, five to ten minutes exposures, repeated every third day, is sufficient. The tube is placed as near the area to be treated as possible—on an average at a distance of about four inches. As a rule, low vacuum tubes should be selected for therapeutic purposes. "The abdominal skin of animals irradiated by him with high vacuum tubes showed little change, while the viscera were hyperæmic. This shows that the penetrating light of the high vacuum tubes is absorbed by the integument to a small extent only, while the internal organs are more strongly affected. On the other hand, the peritoneum showed hardly any reaction, while the abdominal skin became inflamed, where a low tube

was chosen. Still, these conclusions have to be taken 'cum grano salis.'

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*The Nature of Cutaneous Epithelioma, with Remarks on Treatment by X-Ray.* By Chas. W. Allen, M. D.

The paper in the Medical Journal, of January 25, 1902, takes up the usual discussion as to causes and pathology, and concludes with considerations on the treatment which are not in effect conclusive, but instructive. His cases to date have not been treated with X-ray exclusively, but in combination with caustics, and he, therefore, does not advise the use of the rays primarily, but as an adjunct to the knife or caustics—"as an after-cure and prophylactic measure." He makes exposures at from three to five inches (glass, one inch or less from the skin), the time being from three to thirty minutes, the usual sitting fifteen to twenty minutes. He advises a low tube, and employs a static machine.

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*Treatment of Epithelial Skin-Cancers and Sycosis Non-Parasitica with the X-Ray.* By J. F. Rinehart, M. D., of Oakland, Cal.

He writes in the Philadelphia Medical Journal, February 1, 1902, of three forms of primary epithelial cancer, reddish or yellow papule, papillary or warty form, and simple infiltration of the skin. Fissures or excoriations, a covering of a brownish or yellowish crust, and later ulcerations, are shown in all these forms. A vegetating form may result, or carnification may be noted.

X-ray treatment for primary skin cancers has the following advantages :

- (a) No pain.
- (b) But little scar left after the sore has healed.
- (c) Possibility of a more thorough eradication of the disease.

Dr. Rinehart advocates the beginning of treatment with five-minute exposures "at six or eight inches for a day or two." If there be no other reaction, increase the time of exposure until reaction occurs. He notes five cases, including vegetating epithelioma, rodent ulcer, and sycosis non-parasitica. A cure resulted in each case.

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*Stereoscopic Radiography.*

John Hall Edwards, L. R. C. P., writing for the British Medical Journal, calls attention to the value of the above method, and the necessity of special training of physicians for the work.

Inasmuch as it has been recognized by the profession at large that the pursuit of radiography is a legitimate specialism, and as qualified experts have been appointed upon the staffs of some of our larger hospitals, it should follow that no radiographs produced by other than recognized experts should be accepted by surgeons. The state of affairs in London and other large towns, where radiographs are accepted which have been produced at a side show at an exhibition, or by an ordinary professional photographer, is a disgrace; and it is to this practice almost alone that mistakes are due, and discredit is thrown upon an adjunct to surgery which for accuracy and usefulness has never been surpassed in the history of scientific progress. A surgeon who sends his cases to be radiographed by a chemist or manufacturer of apparatus, and accepts the bare evidence of the radiograph (as under the circumstances he is obliged to do) is doing an injustice alike to his patient, to himself, and to those members of our profession who have devoted time, energy, and money in making themselves proficient in a science which, if properly applied, is of immeasurable value, and whose accuracy cannot be gainsaid. Mr. Golding-Bird in his excellent article says "much harm arises from the use of the X-rays by the public themselves, and in the interpretation that they choose to put upon the skiagraph for which they have paid." With this I most cordially agree, and would furthermore like to point out that in protecting ourselves we should be conferring a great benefit upon the public. An X-ray apparatus differs very considerably from a morphine syringe, or a clinical thermometer, inasmuch as it cannot be purchased for a few shillings, and when purchased it is exceedingly difficult to manipulate.

Owing to the great prominence given to the discovery of and experiments with the X-rays by the general press, it will take a long time to educate the public; but it is an easy matter to offer them some protection.

The interpretation of a radiograph depends entirely upon the knowledge and experience of the expert who is asked to give an opinion, and a good opinion cannot be formed from a glance at a radiograph of a fracture taken with a Crookes' tube held in an unknown position. A large amount of distortion is easily detected by anyone used to the examination of X-ray pictures; but a slight amount is often difficult to detect even by an expert.

The public have been blamed for accepting as gospel the state of things shown in a radiograph taken with the Crookes' tube held in an unknown position: but it must be remembered that surgeons are not blameless in this respect, and that, as long as they accept radiographs from unknown sources, so long will the public continue to believe in them.

A surgeon must have had considerable experience in the

interpretation of radiographs before he is in a position to judge of the value of any special print submitted to him. A short explanation is certainly necessary in ninety-nine cases out of a hundred. It would be foolish to imagine that the X-rays will ever entirely replace the older and more generally used methods of diagnosis, but when surgeons fully recognize the power the X-rays place in their hands, and, moreover, take full advantage of that power, the method will prove of still greater use than it has done in the past.

My chief object in writing is to draw attention to a method of applying the X-rays, which, if properly carried out, shows the exact condition of affairs in a fractured limb in such a way that no one can by any possible chance be misled. I refer to what is known as stereoscopic radiography, which consists in radiographing the limb from two points of view, and examining the pictures obtained in the reflecting stereoscope. I doubt if any more perfect method of coming to a correct diagnosis will ever be discovered, although the method itself will undoubtedly be much improved. Stereoscopic radiographs are, of course, much more difficult to prepare, and require more care in their production than ordinary single pictures, but the knowledge they convey bears no comparison with that conveyed by a single picture. One sees at a glance the exact relation of the parts to one another, and the amount and direction of the displacement is self-evident. The radiographic prints must be most carefully prepared and mounted, and must be viewed in a reflecting stereoscope. That this is a disadvantage I will admit, as one cannot expect every surgeon to provide himself with such an instrument; but the advantages are so great that no effort should be spared to secure the best results, and to view them under the best conditions.

Mr. Mackenzie Davidson, who spent much time and thought in perfecting this method, speaks most highly in its praise, and in my own hands it has been of the greatest possible help. In South Africa I frequently had the greatest difficulty in deciding the exact position of a bullet, even after making an exact localization; for although the distance from the skin was mathematically ascertained, it was often difficult to decide whether or not the bullet was embedded in the bone. By preparing stereoscopic prints and viewing them in the stereoscope the matter was placed beyond all doubt. This method is exceedingly useful in ascertaining the amount of injury sustained in the joints of young patients, where cartilage in different stages of ossification under ordinary circumstances forms a great obstacle in the way of forming a correct diagnosis. Stereo-radiography and localization are both founded on scientific principles, based on mathematics, and they are as absolutely accurate as our present knowledge can make them.

As the application of the X-rays (if properly carried out) is

scientific and accurate, they are more likely to give a reliable diagnosis than the more frequently used and less perfect methods. Professor John Chiene once said "that crepitus was the forlorn hope of the surgeon"; yet crepitus is the diagnostic sign most relied upon by the average practitioner. Considering the large number of mistakes made when the old methods are entirely relied upon, it is quite certain that even under the present conditions the X-rays cannot produce a worse condition of things, whilst they are more than likely to produce a better.

The inaccuracies and misrepresentations which accrue from the X-rays, when properly applied, are so few and far between that they may be overlooked, in face of the many advantages gained; and moreover, as these can be reduced to a minimum by surgeons taking the work in their own hands, their future usefulness rests entirely with them.

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## CONSTITUTIONAL DISEASES.

EDITED BY F. H. BISHOP, M. D., WASHINGTON, D. C.

*The Treatment of Phthisis by Means of Electrical Currents of High Frequency and High Potential.* By Chisholm Williams, F. R. C. S. Ed., in the British Medical Journal of October 23.

The treatment of pulmonary tuberculosis, among other diseases, by means of "high-frequency" electrical currents has given such striking results in my hands that I have ventured to lay before you an account of forty-three cases which were under my personal observation, with the sincere wish that the medical profession will give this method a thorough trial. My cases were all of over a year's duration, and were picked by other medical men for the severity of their symptoms. For the physical side of this subject we are indebted to Tesla for the discovery of currents of high frequency and high potential. Much original investigation has been carried out by Continental observers, such as D'Arsonval, Bergonié, Oudin, Doumier, Bordier, and others. I am indebted to my colleague Dr. Pepperdene for drawing my attention to this subject, and together we have severely tested the method, and can fully corroborate the remarkable results that have been obtained elsewhere.

The difference between the currents obtained from the ordinary dynamo, or Ruhmkorff coil, and those of Tesla is that the alternations of the latter are infinite and the electro-motive force proportionally high; that is to say, the alternations of an ordinary coil are about 200 per second and the electro-mo-

tive force of from 10,000 to 200,000 volts, while the alternations of the high-frequency current are millions per second and the electro-motive force from 100,000 to a million volts. This, of course, depends on the means employed.

The secondary terminals of the coil, or transformer, are connected to the inner coatings of two Leyden jars, the armature of these jars being so arranged as to form a spark-gap which is traversed by the currents; the outer coatings of the jars are connected by means of a solenoid. This solenoid furnishes the currents of high frequency and high potential which are used for medical treatment. The methods of treatment are of three kinds: by auto-conduction, auto-condensation, and resonator.

(1) Auto-conduction.—The patient is placed in a large solenoid, and currents are "induced" in the living body, from which sparks may be drawn.

(2) Auto-condensation.—Patient lying on couch, in or under which is a large sheet of metal, which forms one armature of a condenser and the patient the other. In this way currents of from 200 to 300 milliamperes may be safely passed through the body.

(3) Resonator of Oudin.—A solenoid, one end of which terminates in a metal sphere or other shaped terminal, the other end being carried to the outer coatings of the Leyden jars. From this can be drawn a long brush-discharge, or, as it is technically termed, "effluve," similar to the "static breeze," but absolutely painless and of far greater power and intensity. This method can also be used locally, by means of suitable electrodes.

In treating my tuberculous patients I quickly found that general electrification was better than local, and a combination better still. The effects may be more readily understood if we take the several symptoms, etc., seriatim, in a typically severe case of pulmonary tuberculosis.

Fever.—We will presume that for many weeks the clinical thermometer has shown the usual evening rise and morning fall of, say, a couple of degrees. After a few applications (generally and locally) the temperature acts to the stimulus, and if the individual sittings be long, so in proportion will be the height of the rise of temperature we can produce. This, in a severe case, may be to 103° or so; but we find that in from twelve to twenty-four hours it has come down to, as a rule, below the patient's lowest point, and, as we persist or desist in the application, so does the temperature rise or fall. Later on we reach a stage where even prolonged exposure to the high-frequency currents will produce no rise. When that stage is reached the patient is to all intents and purposes well; and should a relapse occur, it would be easy to resume the treatment for a while.

Cough.—After a few days is relieved, and after a few weeks is greatly lessened; though a dry cough without expectoration may persist for many months.

Sputum.—At first the usual muco-purulent expectoration, which may be offensive, loses its offensiveness, and generally in a month or so becomes almost nil; it often becomes rusty, like typical pneumonic sputum, altering in consistency and color according to the increase or lessening of the application of the currents.

Tubercle Bacilli.—These, very early in the course, become increased in numbers, then afterwards have a tendency to form clumps, and later, as the patient improves, get to an extremely small number and may become somewhat irregular and small in shape. Most of my cases have still a few bacilli in their sputum, but their general health remains good. The bacilli seem to follow the course described by Drs. Forbes Ross and Norris Wolfenden in their paper on the "Effects Produced in Cultures of Tubercle Bacilli by Exposure to the Influence of an X-ray Tube" (Archives of Röntgen Ray, August, 1900). They say, in conclusion, "There is not the smallest doubt that X-ray stimulation does not kill tubercle bacilli, but stimulates them to excessive overgrowth, and only affects them adversely by attenuation from overgrowth."

My numerous observations point strongly to the view that the high-frequency currents act in a very similar manner on the tubercle bacilli in the patients' lungs.

Perspiration.—This soon keeps pace with the temperature, but generally subsides after a few weeks' treatment, and then only recurs if the treatment is pushed and the temperature rises unduly. Prolonged influence of the currents will produce sweating in a healthy adult.

The appetite is soon brought to a more normal standard, and the power of digestion greatly increased. The kidneys at first excrete large quantities of phosphates; but these, however, quickly clear off and the urine becomes normal.

Body Weight.—As a rule steadily increases with the improved digestion. A pound a week from the start will be scaled sometimes; the patient remains stationary a week or so and then puts on several pounds as if to make up for lost time. A common occurrence was a gain of fourteen pounds in three months.

Diet.—Light nutritious diet was ordered and the patients took what their means would allow them, the great majority coming as hospital patients from the most overcrowded and unhealthy parts of London. Practically no drugs were used except an occasional laxative. Cod-liver oil and such like foods were generally allowed after one month's treatment, when one imagined that the digestive powers were in a better condition to absorb them. One patient persisted in taking

a cod-liver oil emulsion, and more often than not brought it back with the last meal. After three weeks' treatment patient could take four ounces a day without unpleasant symptoms, and I believe great benefit.

An attempt was made to instill into the majority of the patients' minds the elementary rules regarding ventilation of rooms, etc., but their circumstances in life did not allow of many taking our advice.

Pulse.—From a vast number of observations one finds that the pulse-rate is increased 20 or 30 beats during the actual application of the currents, but in a few hours or less it regains its usual rate; that is, in tuberculous subjects; in others the increase is much less marked. In slightly neurotic cases it may be irregular.

Anaemia.—The mucous membranes in a few weeks look brighter, and the skin becomes more pink, looking and acting more normally.

Congested capillaries of the cheeks rapidly disappear; perhaps the general lowering of the temperature causes the "hectic flush" to go, or, may be, the increased nutrition of the skin masks it.

Clubbed Fingers.—Follow the usual course of a phthisical patient when recovering from the disease. The nail edges become more square and the free margins elevated. The fingers between the inter-phalangeal joints thickens from the deposition of fat.

Menstruation.—Was mostly absent, irregular, or pale, and very generally scanty; improved very rapidly under the treatment. I have observed the same phenomena in cases of severe chlorosis unassociated with phthisis. In one case the menses had been absent for over nine months; after six bi-weekly applications, became normal in every respect.

Breathing.—If short and difficult, quickly becomes longer and easier, the chest capacity soon improving. In one case, although in five weeks the patient only put on 1 1-4 pounds, the chest measurement showed an increase of 3 1-2 inches. The rate of breathing is increased during the actual applications of the currents.

In using this form of treatment for consumption the medical man should most carefully watch the temperature chart, and let that direct him regarding the dosage. Some knowledge of electricity is required for its successful application. Generally speaking, in severe cases ten minutes a day is sufficient, but may be quickly increased providing the fever does not go too high (over 101.4°). I give all cases general electrification, and in addition, to some locally, the "effluve" from a metallic brush. Actual sparking of the chest wall is somewhat painful and should never be used in phthisis. If the

"effluve" is of proper consistency, the skin feels as if it was receiving a soft warm breeze.

According to Dr. W. Osler, in ninety-five per cent. of cases seen by physicians the patients are unable to afford any treatment away from their own homes. By this method they can all be treated by their own doctor. The necessary apparatus is costly, but the good results make the initial outlay fade into insignificance. Arrest or cure of tuberculosis is entirely a question of general nutrition, and we have in this high-frequency method a most powerful means of strengthening the body cells to resist the effects of the microbe. I will not weary you with "theories" as to how electricity in this form acts, but leave it to your knowledge and consideration. Its advantages over other forms of treatment may be briefly summarized thus:

**Effectiveness.**—Of 43 cases 42 put on weight, lost all symptoms except in a few where a slight cough remains and a few bacilli may be found occasionally. Physical signs generally remain long after the patient is at his maximum weight (for height). One case was only treated four weeks, gained 3 1-2 pounds, then in the fourth week had, through his own carelessness, pneumonia; he recovered, but with the loss of his 3 1-2 pounds. Some patients are not amenable to any form of treatment.

**Time.**—Varies with the severity of the symptoms; an average in a severe case would be three months. Thus, the first month applications might have to be made daily; second month, every other day; third month, twice a week.

**Expense.**—In several of my male cases their ordinary occupation was resumed after a month or so. To the greater proportion no treatment could have been undertaken away from their homes, as they were not in a position to afford the necessary expense of, say, "open-air treatment," or even a "change of air."

To those practitioners possessing an efficient X-ray apparatus the treatment could be readily applied, if the necessary additional apparatus be procured.

In conclusion, I wish to thank those medical men who have helped me to test this method by sending me cases of phthisis selected for the severity of their symptoms.

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## CLIMATOLOGY.

*Influences of Climate in the Treatment of Tuberculosis.* By J. Edward Stubbert, M. D. (from the Post-Graduate for November).

So far as we know at the present time, in spite of the many advertisements which we read not only in the daily press but,

I am sorry to say, in medical journals, of the various treatments for tuberculosis, we have not yet arrived at anything that can be called a specific. That the time may come we all hope, and reasonably so, when we will be able not only to absolutely cure cases in which there is not too much loss of tissue, but when we can vaccinate against tuberculosis just as we do against other infectious diseases. So far as we now know, all treatment must be based upon climatic and hygienic conditions.

The question of climate troubles the physician more than any other now. There is too much of an attempt to treat climatically without the intelligent use of auxiliaries. One physician will send his patients to Colorado, another to the Adirondacks, and another South, just as in Europe they send them to the Riviera. I have a patient now who was sent from Ireland to Colorado by his physician, who did not know how far that State is from the seaboard, how high its elevation, or anything else of value about it; he simply knew that there was such a place, and told his patient to go there. This man's heart condition is such that, if he went to Colorado, he would not do well at all. I simply use this as an illustration to show that, while climate is the great basis of all treatment, we should discriminate. It is just as essential to individualize cases in selecting a climate as it is in selecting auxiliary treatment after placing them under proper climatic conditions.

The lesson that has been taught at Liberty is that patients can go to what is called in the West a low altitude, and ultimately return safely to their homes and work; this has been an incentive to the home treatment of tuberculosis.

When we come to the question of selecting a climate away from home, we should avoid the seashore, excepting in a few localities, and in the very incipient stage of the disease. In Europe good results have been obtained by sending patients rather indiscriminately to the Riviera, but here again we must attribute a large percentage of the improvements to concomitant conditions referred to already. Twenty years ago I treated a large number of pulmonary cases in Florida and Georgia for the late Dr. Loomis, and, in the majority of cases, the results were bad. The climate of Florida is not at all equable. I have driven out at nine o'clock in the morning with a linen duster, and at night worn with comfort an over-coat.

There are, however, points along the northern seacoast where satisfactory results have been attained in a fair percentage of incipient cases. One of these is Atlantic City, on the Jersey Coast. The climate here is undoubtedly modified by the Gulf Stream. There are northeast storms which make it necessary for the patients to stay indoors at times, but, with that exception, the climate is a fairly equable one. As we move

further north along the coast the reverse is true. There is one place, Point Pleasant, where one can send children who are growing up and who have only a slight trouble, perhaps, at one apex. These patients do well, not so much, I believe, on account of the climatic conditions as that they live out of doors constantly. They spend their days rowing, sailing, etc., which induces to a better and more healthful mode of living in places where people are herded together, as in ordinary summer resorts. It is different as we go further up the coast —to the New England coast, for instance. A great many people go to Newport, Nantucket, etc. Results at Newport are bad, and must continue to be so. The only point in this region where I have seen patients do well is Martha's Vineyard, where many improve winter and summer. But the number of seacoast points where we can send patients is so limited that we must look to inland points of high, or moderately high elevation, according to the case in hand.

Colorado is the best illustration of a very high altitude, and is the best we have in this country. It has a stimulating climate, exceedingly dry, and its only objectionable feature is that a patient cannot return within a reasonable length of time to his business.

The mental side influences very largely the results to be obtained. If there is anxiety, we cannot hope for the best results.

We have in the eastern part of the country the Adirondacks, where we find altitudes from 1200 to 3000 feet; at Liberty, Sullivan County, in the Shawangunk Mountains, the elevation is 1700 to 2500 feet; and the Berkshire Hills in Massachusetts.

Far advanced cases should always be kept at home; but if a change is insisted upon, it is useless to send them anywhere excepting, possibly, to low altitudes where the climate is a sedative one, as at Atlantic City and Old Point Comfort. It is unkind to send patients in the far-advanced stage as far away as California, because they will be deluded with the vain hope of recovery or they will die en route. Therefore I should advise sending such patients in the West to the Californian Coast, and in the East to selected points along the Atlantic coast.

We can treat very many cases successfully right at home. If, however, you have a case with a narrow chest, undeveloped lungs, if the patient is poor physically all the way through, send him to high altitudes. There is nothing more conducive to development of the chest than a high altitude. If you have a heart action ranging from 110 to 130, with an average of 120, you should be exceeding careful about sending that patient at first to a high altitude. It is best to send such patients up by steps, 700 feet at first, say to Summit, N. J.; then a little higher and higher until the altitude at which they

improve most rapidly is reached. Incipient cases nearly all do well in high altitudes, provided the heart action is good. That hemorrhage cases do not do well at high altitudes is a mistake. As a Colorado physician said at Buffalo last week, "If a man has a hemorrhage in Boston, is taken out of bed within forty-eight hours, put on the train and hustled out to Colorado, and carried up to an elevation of several thousand feet, what should you expect but that his hemorrhage would continue?" On the contrary, patients who are allowed to rest after the initial hemorrhages before they are sent on the journey very seldom have hemorrhages after arriving at their destination. At the Loomis Sanitarium, at Liberty, we have records of cases who have had four, five, and six hemorrhages before admission, some of whom have had none, and others only one after coming to Liberty.

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## DERMATOLOGY.

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

*The Treatment of Lupus Vulgaris and Some other Disease of the Skin by Finsen's Light Method and X-Rays.* From the British Medical Journal for September 28, 1901.

At the sixty-ninth annual meeting of the British Medical Association at Cheltenham, July 30, 31, August 1 and 2, 1901, the Section of Dermatology held an exceeding valuable and interesting discussion on the above subject by eminent men, including Malcolm Morris, F. R. C. S. Edinburgh, Surgeon to the Skin Department, St. Mary's Hospital, who this year delivered the course of Lane lectures at Cooper Medical College, San Francisco, Cal.; Arthur Barry Blacker, M. D., B. S., Superintendent of X-Ray Department, St. Thomas Hospital and Hospital for Consumption, Brompton; James Harry Sequeira, M. D., M. R. C. P., Physician North-Eastern Hospital for Children, Dermatological Assistant, London Hospital; W. Allan Jamieson, M. D., F. R. C. P., Edinburgh, Physician for Diseases of the Skin, Royal Edinburgh Infirmary, Lecturer on Skin Diseases, University of Edinburgh; Henry A. G. Brooke, M. B., M. R. C. S., Physician Manchester and Salford Hospital for Skin Disease, Lecturer on Dermatology, Owens College; Norman Walker, M. D., F. R. C. P. Ed., Assistant Physician Skin Department, Royal Infirmary, Edinburgh; George G. Stopford Taylor, M. D., Physician to the Liverpool Skin Hospital; Dr. Noiré, Paris; Dr. Sabouraud, Paris; J. F. Hall-Edwards, L. R. C. P. Edin., Superintendent X-Ray Department, General Hospital and Royal Orthopaedic Hospital, Birmingham; George Beckett Batten, M. D., Dulwich; Joseph S. Bolton, M. D., Nottingham; Willmott H.

Evans, B. S., F. R. C. S., B. Sc., Assistant Surgeon and Surgeon to the Skin Department, Royal Free Hospital; and H. Radcliffe Crocker, M. D., F. R. C. P., Physician Skin Department, University College Hospital.

Mr. Malcolm Morris in 1899 visited Copenhagen and learned Professor Finsen's method in full. With the assistance of Dr. S. Ernest Dore he has carried on his work in his fully equipped establishment in the West End of London. He employs the same apparatus as Professor Finsen, but uses the electric light only. A current of 70 amperes and 60 volts, with short time of exposure, is preferred. A light of great power has two factors of importance: the lenses, especially the bottom one, must be clean and bright, the water "clear and free from floating particles." Accuracy of focus is essential, and "if the disease is so situated as to make this impossible, the Roentgen rays prove of service." Keep area treated "within the focus of the light, but a smaller focus, if it can be borne, has a greater effect." Thumbscrews are preferable for focusing. Keep the tubes in a straight line with the light rays, and have the rays "fall perpendicularly on the compressing glass. By the use of cardboard or metal screens fixed to the end of the tubes, the slight deviation of the glass will be at once revealed by the fact of its throwing light on the screen, and can at once be rectified." Lpus vulgaris, lupus erythema-tosus, rodent ulcer, alopecia areata, keloid, and epithelioma were treated. In the treatment of lupus successfully, the number of sittings was from "8 to more than 370." The disease was mostly superficial and of small extent. In the successful treatment of a case of rodent ulcer the X-rays were used in connection with the light treatment. The combined method is "based on the fact that while light rays cannot be made to act on any but plane surfaces, the X-rays, owing to their power of penetrating soft tissues, can be directed on mucous membranes lining the cavities of the body." A cardboard and lead foil mask with a hole corresponding to the part to be treated, covered the face. A spark gap of six or seven inches was used, and the time of exposure was from ten to fifteen minutes, until "inflammatory effects were produced, when treatment was suspended for a few days. Marked improvement took place after fifteen or sixteen exposures.

The effect of the light is "hyperæmia and redness, followed by the formation of a bleb, which breaks and dries in about a week, into a thick yellow crust. Healing is complete in ten days or a fortnight. The intensity of the reaction varies in proportion to the intensity of the light and also according to the structural peculiarities of the patient's skin, and especially according to the local conditions produced by the disease." Thin skin

shows greater reaction, and blonds are more susceptible than brunettes. Reaction occurs from five or six to twenty-four hours after the application of the light. "Even after prolonged treatment it still shows a tendency to increase rather than diminish." Danish physicians claim the treatment is free from pain, but Mr. Morris states that this is not an accurate statement.

As the remedial effect of light rays is proportional to the intensity of the reaction, a considerable reaction should be aimed at. In some cases the reactions are unbearable by the patient. To shorten the time of treatment in some cases pyrogallic acid ointment "five per cent. is applied daily for a week, when the part is allowed to heal" and the light treatment is resumed. For hypertrophic cases pyrogallic acid ointment or pyrogallic acid ointment with salicylic acid may be used to reduce thickening in some cases, while in others thyroid extract internally will reduce oedema and thickening.

But a small spot is treated at a time, although sometimes a treatment in cases of large area may last for two or three hours daily, if not too exhausting. "Cases in which mucous membranes are involved are unfavorable, because (1) the disease is often inaccessible, being situated on the palate, the gum, or the floor of the mouth; (2) they are often badly ulcerated and do not seem to have the same aptitude for repair as skin; and (3) they are always moist and offer a good breeding ground for micro-organisms. The first of these difficulties can be got over by the use of the X-rays to supplement the light.

"Cases that have not been treated are, other things being equal, the most suitable for the light method." In cases of special urgency, treatment may be two or three times a day. Intelligence, skill, and devotion are necessary on the attendant's part and patience on the patient's part.

The light treatment Mr. Malcolm Morris considers to be the best for lupus, but states that it is not infallible. Next to lupus, it has given success in rodent ulcer, and in lupus erythematosus it is beneficial; but in alopecia areata Mr. Morris did not have Dr. Bie's success, although he confirmed Dr. Bie's statements as to the light treatment in general.

Dr. Arthur Barry Blacker compared the Finsen light and X-ray treatment. The modification of Finsen's light apparatus was that of Lortet and Genoud. It was cheaper, more convenient, used less current, and shortened the time of exposure to fifteen minutes daily. In work the time of reaction with Finsen's rays was from four to twenty-four hours; with the X-rays from four to twenty-four days. The reaction with the Finsen rays was not marked, and was easily controlled; that with the X-rays proved severe at times, and was liable to cause an intractable ulcer. The latter could be guarded

against by using a "high" tube, protecting the surrounding part with lead foil, and watching the effect of short exposures. Dr. Blacker used chloretone and orthoform for the pain from ulceration.

Finsen's rays from the violet end of the spectrum differed from the X-rays as follows: (1) In the reaction produced on the skin; (2) their penetrative power; (3) mode of production; (4) employment. Rays from the sun or electric arc lamps give success in the treatment of lupus, but much more would have to be proved "before the X-rays could be considered as being safe or reliable."

Dr. James Harry Sequeira stated at the London Hospital where 200 patients had been treated, three lamps having been continually in use, he had observed every case of lupus vulgaris improve. The number of treatments per case were from 2 to even 300, and some patients were still under treatment. The latest statistics of Finsen's clinic showed that over 130 patients were free from recurrence from one to five years after treatment. Some cases of lupus erythematosus improved, but those in which the erythematous element was pronounced were not suitable for the treatment. He used a modified Lortet and Genoud lamp, worked from an ordinary street current. The sittings were of fifteen minutes' duration. An area of skin 1 1-2 inches in diameter could be treated each time. "Referring to the relative value of the Finsen and X-ray treatment, he had found that ulcerated forms of lupus yielded excellent scars with X-ray treatment, but in the scars typical lupus nodules were visible even when the treatment had been carried on for several months. He endorsed Mr. Malcolm Morris' experience of the X-rays in lupus of the mucous cavities. "The ulcers healed rapidly, and huge cavities filled up in a remarkable manner." In treatment of cancer by the X-rays pain was relieved and ulceration dried up, although some cases persisted.

Dr. W. Allan Jamieson had used a coil with a ten-inch spark. A soft tube was used, the distance having been from six to two inches. Exposures were made four times daily for a week, an average current of 2 1-4 amperes being employed. Results were unsatisfactory. In one successful case he used X-rays for thirty exposures, usually for ten minutes, distance having been from six to four inches. He thought that X-rays exercised "their chief power over perversions of growth."

Henry A. G. Brooke, M. B., considered that "the X-rays were most useful in the more inaccessible areas of disease of the nasal and oral cavities and in extensive cases as a preliminary treatment." They were harder to manage than the Finsen light, as they produced tropho-neurotic ulceration. He believed in a combination of methods.

Mr. Norman Walker considered the X-rays particularly successful in extremely obstinate cases. A case of lupus was benefited by a weekly treatment for eight months. In sarcosis, too, he believed it to surpass any other remedy in efficiency. He considered favus to be best treated by X-rays. Mr. Stopford Taylor had treated lupus, scrofuloderma, rot ulcer, large ulcer of the left forearm after burns, favus, helioma, pigmented carcinoma, and drew the following conclusions from the action of X-rays on lupus vulgaris:

1. Rays applied to a moist surface lessened the discharge and changed it from a serous to a purulent character.
2. That normal epithelium developed very rapidly and incisively followed.
3. That when applied to dry surfaces exfoliation of the epidermis took place and the part exhibited a dried and shrunken appearance.
4. That absorption of morbid products took place, resulting in a smooth, soft, and pliant scar.
5. That an erythema of uncertain duration, depending not together upon the length of exposure or of its strength, always accompanied these changes, and that unless this was permitted to disappear between each successive application of rays an aggravation of the disease occurred."

The X-ray erythema occurred most quickly in scrofulous glands, and bony prominences were the sites for superficial destruction of tissue. He regards X-rays to be a stimulant. Case of multiple rodent ulcers of the left upper cheek and upper eyelid was cured "after a series of twenty-minute exposures to the rays, amounting in the aggregate to four hours."

Mr. Noiré of Paris said reaction was more marked from the treatment by the apparatus of Drs. Lortet and Genoud than from the Finsen light, but that the curative effect with the former apparatus "went less deeply" than was the case with the Finsen method.

Mr. Sabouraud of Paris had treated nearly fifty cases of alopecia areata with the Finsen apparatus, and said it was useful "especially in cases in which the areas were limited, and in which the skin was thin and atrophic, when the areas had failed to spread, and for a long time had not grown new hair." In other cases the treatment was "not better than many other methods. In tuberculous lupus the results of this treatment were marvelous. There was no other therapeutic method which could be compared with it."

The principal point made by Mr. J. F. Hall-Edwards was that the same pigmentation occurred with the Finsen method as with the use of the X-rays."

Mr. George Beckett Batten claimed that with care X-ray rhinitis and its consequent pain could be avoided. He said one should never use a tube except with a blue cloud in front

of the anti-cathode, and not one with the blue cloud behind the anti-cathode. A soft tube gave similar results, but was more dangerous." A heavy discharge tube should be used.

Dr. Joseph S. Bolton noted the four different kinds of treatment, by

1. Finsen light.
2. X-rays.
3. High-frequency currents.
4. Ordinary wave current from an influence machine.

Mr. Willmott H. Evans had obtained good results from "a small arc lamp in which the carbons were cooled by means of a current of water close up to the arc." A current of 15 amperes was used. Reaction resulted more quickly than from the Finsen light.

Dr. H. Radcliffe Crocker preferred low-tension tubes, and considered 5 amperes of current necessary.

A.-S.

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## HYDROTHERAPY.

*Chronic Cases of Phthisis.* By Dr. Simon Baruch, in the Post-Graduate for November.

In cases of consumption in which temperature is not an element of consequence—we have to enhance the reactive capacity of the patient by warming him up. This is a discussion on home treatment, and I will tell you what to do at home. Wrap the patient like a mummy in two long-hair woolen blankets very snugly, wrapping him so that very little air can reach his body. After he is wrapped in this dry pack, place hot water bottles to his feet and perhaps about his sides, and give him small draughts—say two ounces—of water at 40 to 50° every few minutes, to enhance the tension of the pulse, increase the action of the skin, and arouse the peripheral circulation thoroughly. This requires about half to one hour. He is then gradually uncovered and treated as described in the acute conditions, first using the wet hand, beginning at 80°, and reducing daily one or two degrees, until 60° or even 50° are reached, always bearing in mind that a reaction must be produced. Every day more water is used, friction with a bath glove or wash-rag being added. The patient's reaction is so improved by this treatment that after a week or two he does not need to be wrapped in blankets to warm him up. Then I make him stand in water above his ankles. Having provided water at 85° in a bucket, dip it up with a long handle dipper, and throw six to twelve dipperfuls with considerable force upon the body over successive parts. This is a good and simple method of educating and disciplining the nerves and blood vessels of the skin to bear colder and colder water, to bear greater and greater force, and to produce a good and

fruitful reaction. Just as we may raise the muscular power of the deltoid by daily dumbbell exercise, so may we raise the neuro-vascular activity and responsive capacity to temperature changes by daily decreasing the temperature and measuring the pressure of water-throws upon the skin. This is the principle on which the treatment can be adapted to varying conditions met in phthisis. When chilling is produced there is some defect in the technique.

After the treatment of these chronic cases I generally advise—not as is the rule with a Turkish bath—to let the patient lie down and rest. No, the cutaneous circulation having been raised to the highest activity, and not relaxed, as in a Turkish bath, there is no danger of taking cold. Let the patient go into the open air and get the benefit of more oxygen which the deepened inspiration will furnish, and thus improve hematosis and appetite, digestion and consequently nutrition. The latter is the keynote to the successful management of tuberculous patients.

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### **SOCIETY MEETING.**

#### **ELEVENTH ANNUAL METING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.\***

**THIRD DAY—THURSDAY, SEPTEMBER 26.**

The meeting was called to order by the president at 9.30 a. m.

On motion of Dr. Gerin, the reading of the minutes was dispensed with.

Dr. C. R. Dickson presented the following as the report of the Nominating Committee:

President, Dr. Frederic H. Morse of Melrose, Mass.; first vice president, Dr. Daniel R. Brower of Chicago; second vice president, Dr. Alfred T. Livingston of Jamestown, N. Y.; treasurer, Dr. R. J. Nunn of Savannah, Ga.; secretary, Dr. George E. Bill of Harrisburg, P. A.; executive council, in place of Drs. Massey and Newman, who retire, Dr. Newman and Dr. E. Wende, for three years.

On motion the time and place of meeting were left to be decided upon subsequently by the president and secretary in conference with the Executive Council.

On motion of Dr. Gerin, seconded by Dr. White, the report

\* Held at Buffalo, N. Y., September 24, 25, and 26, 1901. Ernest Wende of Buffalo, President.

of the Nominating Committee was accepted, and the secretary was instructed to cast the ballot for the names mentioned in this report. The ballot was cast, and the officers mentioned were declared duly elected.

Dr. John Gerin of Auburn gave notice of a proposed amendment of Article IV., striking out the words "and shall not exceed 150 in number."

Dr. W. B. Snow moved that a rebate of five dollars be made to all members coming in next year, pending the adoption of the amendment bearing upon this point. Seconded by Dr. Massey and carried unanimously.

Dr. W. H. White reported that the Auditing Committee had examined the treasurer's accounts and vouchers and had found the same correct. On motion of Dr. Massey, the report was received and ordered placed on file.

On motion of Dr. Gerin, seconded by Dr. Gibson, permission was given Dr. Snow to use the monogram of the Association on the outer page of the new Journal.

As some dissatisfaction had been expressed with the name chosen for the new electro-therapeutic journal, Dr. W. B. Snow proposed that the Association select a name which would give general satisfaction.

Dr. Gerin moved that the title of the journal be made The Journal of Electro-Therapeutics. Seconded. After prolonged discussion, Dr. Gerin withdrew his motion, and on motion of Dr. Dickson the question of the name of the journal was left to the Executive Council, the latter being requested to take into consideration the suggestions already made.

Dr. George E. Bill of Harrisburg presented the report of the secretary, and, on motion, the report was adopted.

Dr. R. J. Nunn of Savannah presented the report of the treasurer, which was, on motion, accepted.

On motion of Dr. Massey, seconded by Dr. Dickson, the usual honorarium of fifty dollars was voted to the secretary, and he was also given a vote of thanks for his services.

On motion of Dr. Snow, a vote of thanks was tendered to Dr. Robert Newman for his earnest labors on behalf of the Association in connection with the preparations for the present meeting. The motion was amended by Dr. Nunn by adding, and that a presentation copy of the last two years' transactions be handsomely bound in morocco and appropriately

lettered, and presented to Dr. Newman as a token of the appreciation of the Association of his work. Carried.

On motion of Dr. Dickson, a vote of thanks was offered the local committee and those who had placed the armory at the disposal of the Association for the place of meeting.

On motion of Dr. Gerin, a vote of thanks was given to the retiring president for his labors, which had culminated in this very successful meeting.

On motion, the executive session was declared adjourned at 10.15 a. m., and the regular scientific programme was taken up.

Dr. G. Betton Massey of Philadelphia presented a paper entitled "The Case of Mrs. D.: A Study in Contemporary Gynecology." Discussion by Drs. Reyburn, Bayliss, O. S. Phelps, and Nunn, and the discussion was closed by Dr. Massey.

On motion, the Association again went into executive session in order to allow of the transaction of the following business.

Dr. W. J. Morton moved the adoption of the following resolution:

*Resolved*, That a committee of three be appointed by the Chair to report at the next annual meeting upon the nomenclature of the static-induced current and allied spark-gap currents derivable from static machines and electro-static apparatus.

Seconded by Dr. Snow and carried.

Dr. Gerin moved that a special committee be appointed, with Dr. L. A. Weigel as chairman, to formulate a plan for X-ray work.

Seconded by Dr. Snow and carried.

Dr. Charles R. Dickson of Toronto, Canada, made some remarks entitled "Problems in Electro-Therapeutic Practice." They were discussed by Drs. Snow, Morton, and Massey.

On motion of Dr. F. B. Bishop, the Executive Council was requested to make suitable provision for the new feature just proposed by Dr. Dickson in connection with making up the programme for the next annual meeting.

On motion, Dr. A. D. Rockwell's paper on "The Use of Electricity in Renal Disease" was ordered read by title.

Dr. Robert Reyburn of Washington, D. C., read a paper on

an "Easy Method of Testing the Strength of the Galvanic Current." It was discussed by Mr. Livingston.

(To be Continued.)

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## BOOK REVIEWS.

**A SYSTEM OF PHYSIOLOGIC THERAPEUTICS.** A Practical Exposition of the Methods, other than Drug-Giving, useful in the Treatment of the Sick. In eleven octavo volumes. By American, English, German, and French authors. Edited by Solomon Solis Cohen, A. M., M. D.; Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physician to the Philadelphia and Rush Hospitals, etc.

Of this valuable series already five attractive and instructive volumes have been published.

Volumes I. and II.—Electrotherapy. By Geo. W. Jacoby, M. D., of New York, with special articles by Edward Jackson, A. M., M. D., of Denver, Col.; Wm. Scheppegrrell, M. D., of New Orleans; J. Chalmers Da Costa, M. D., of Philadelphia; Franklin H. Martin, M. D., of Chicago; and O. H. Ohmann-Dusnessul, M. D., of St. Louis. The first volume of the work is graphically illustrated in Section I., and treats the physics of the subject in a most thorough and practical manner. Section II. is devoted to the consideration of the apparatus in medical use, and the different modes of administration. The usual static modes are given, except the Morton wave current, which was published in 1899, and possesses so much recognized merit that the omission is unfortunate. The galvanic and faradic apparatus, controllers, meters, and electrodes are treated extensively, with mention of the high-frequency apparatus of D'Arsonval. The closing chapter treats briefly of the use of the X-ray apparatus, with special reference to evils. Volume II., in treating of the physiological action, deals generally with the effects of galvanism and faradism, and devotes little space to the consideration of the static and other high-potential modalities. The treatment of the former is practical and reliable.

In considering Special Therapeutics, Section II. follows along the lines of the employment of the older methods—the constant and interrupted currents—but fails to recognize well-established facts in the employment of static and other high-potential modes of application as to their use in acute inflammatory affections and neuralgias. The writer errs especially in his consideration of the treatment of sciatica by static electricity. There is also abundant evidence to confirm the value of electricity in the treatment of acute and chronic affections of the spinal cord. The articles in the addenda are generally excellent, especially the chapter on the Application of

*Electricity to Diseases of the Nose, Ear, and Throat*, by Dr. Scheppegrrell. The treatment of this department is practical, exhaustive, and up to date. The work as a whole, accomplishes well what was undertaken, and is a valuable addition to the literature of the subject.

Volumes III. and IV.—*Climatology*. By F. Parker Weber, A. M., M. D., F. R. C. P., of London, Eng.; Guy Hinsdale, A. M., M. D., of Philadelphia; and Titus Munson Coan, M. D., of New York; with maps prepared by W. F. R. Phillips, M. D., of the United States Weather Bureau of Washington, D. C.

The first volume, in two sections, treats (1) of the Physics, Physiology, and General Therapeutics of Climate, and (2) of a Description of European Health Resorts. Section I. sets forth in a clear and instructive manner a discussion of climate in relation to atmosphere, in which temperature, light, moisture, absolute and relative humidity, altitudes, aerial currents, soil, and general topography, with a classification and effects are ably considered. The first chapter of Section II. is devoted to ocean voyages to and from all principal points on the globe. The consideration of health resorts and climates in both Part II. of Volumes III. and IV. includes all places of note on both continents, and the subject is treated with a fairness and accuracy that is deserving of commendation. Part III. in Volume IV. treats of climato-therapeutics in two sections, the first devoted to the general management of patients at health resorts, and the second to special therapeutics. In the treatment of the former the writer has set forth the general principles and shown the recognized importance of institution treatment of many maladies. In the latter, views are expressed in an able and creditable manner upon which some diversity of opinion exists. The maps are a valuable and instructive feature of the work, and reflect credit upon the author. As a whole the volumes are a valuable addition to the series, and should be in the library of the physician who would direct journeys of patients in search of health, or who would seek health and recreation for themselves.

**STUDIES IN THE PSYCHOLOGY OF SEX. SEXUAL INVERSION.** By Havelock Ellis, L. S. A. (England); Fellow of the Medico-Legal Society of New York and the Anthropological Society of Berlin; Honorary Fellow of the Chicago Academy of Medicine, etc.; General Editor of the Contemporary Science Series since 1899. The "Studies in the Psychology of Sex" will probably be completed in five volumes. "Sexual Inversion" is second volume in the Series. Pages xi+272. Size, 8 $\frac{1}{2}$  x 5 $\frac{1}{2}$  inches. Extra cloth, \$2.00 net, delivered. Sold only to physicians, lawyers, advanced teachers, and scientists. Philadelphia, Pa.: F. A. Davis Co., Publishers, 1914-16 Cherry Street.

The writer's treatment of this subject, upon which so little is to be found in medical literature, is studied, elaborate, and scientific. The large number of cases of sexual inversion

in both cases amply illustrates the types of perversion. In the conclusion the writer considers the relation of the unfortunates to society. He shows (1) that prevention with the congenital invert is of no avail, "but as in a large proportion of cases there is little obvious congenital element, sound social hygiene should render difficult the acquisition of homo-sexual perversity ;" (2) treatment and management of perverts is most unsanitary ; (3) that legal regulation should protect the innocent and judiciously restrain, but not persecute, the unfortunates. The work is a valuable addition to medical literature.

**PROGRESSIVE MEDICINE.** VOL. IV., 1901. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and *Materia Medica* in the Jefferson Medical College of Philadelphia. Octavo, handsomely bound in cloth, 409 pages, illustrated. Per annum, in four cloth-bound volumes, \$10.00. Lea Brothers & Co., Philadelphia and New York.

This volume contains so much material of exceeding interest that we can call attention to but few of the most important article. That Dr. Max Einhorn deals with the diseases of the digestive tract is enough to recommend that section. Genito-urinary diseases are dealt with by Dr. William T. Bellfield; Physiology by Dr. Brubaker; Hygiene by Dr. Henry B. Baker ; and Diseases of the Kidneys by Dr. J. R. Bradford of London. Perhaps the best section is the one on Anæsthetics, Fractures, Dislocations, Amputations, Surgery of the Extremities, and Orthopedics, by Dr. Joseph C. Bloodgood ; the article on Spinal Anæsthesia being most timely and excellent. His conclusions agree with those of Bier, that the method in its present form is unfit for general employment. The subject of blood examination in surgical cases is handled extremely well.

The last section in the book, a Practical Therapeutic Referendum, by Dr. E. Q. Thornton, is one that will often be consulted for the latest opinion on the new drugs, and the late views of the actions of the older ones.

**PRACTICAL FIRST PRINCIPLES.** Simplifying the Study of Normal and Abnormal Structure and Function, and Aiding Diagnosis. Designed for the Use of Students and Practitioners of Medicine. By A. H. P. Leuf M. D., Associate Editor of the Medical Council, Philadelphia. Published by the Medical Council, Twelfth and Walnut Streets.

"Practical First Principles" covers a field of its own, and will be of great value to students and physicians in the elementary study of cell life and cell functions. Many students and doctors are unable to fully comprehend much that they read in advanced works, because they have never obtained a thorough knowledge of the underlying principles of the subjects treated. The material in "Practical First Principles" is well digested and ready for assimilation.

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No. 4.

## ELECTRICAL TREATMENT OF NEURITIS.\*

BY FREDERICK H. MORSE, M. D.,

President of the American Electro-Therapeutic Association.

There is no form of disease with which we, as electro-therapeutic specialists, are oftener confronted than some form of nerve inflammation, and I speak particularly of the subacute and chronic forms of inflammation of the peripheral nerves. Neuritis has for a long time been a recognized disease; its frequency, and the extent and importance of its results, however, have not been appreciated until within a comparatively short time.

The so-called muscular rheumatism, lumbar, and sciatic rheumatism, are almost invariably cases of neuritis.

The brachial plexus, the sciatic, median, ulnar, and radial nerves, and the sciatic and lumbar regions are especially prone to the condition because of the greater liability to injury and exposure.

Injured nerves may become the seat of a chronic inflammation which extends along the nerve, involving considerable extent and even leading to permanent damage of the nerve trunk. Exposure to cold and debilitating fevers are occasionally among causes, as are also rheumatism and syphilis; but it is the traumatic cases which we are most often called upon to relieve. That form is more likely to develop into degenerative atrophies of both muscles and nerves involved.

Many cases of apparently obscure origin are the result of gradual compression of a nerve by a mass of fibrous or cicatricial tissue.

This condition is often found in our gynecological work, and the pain is most conspicuous reflecting along the sciatic and anterior crural nerves.

Read before the annual meeting of the American Electro-Therapeutic Association at Buffalo, N. Y., September 26, 1901.

Cases of acute neuritis sometimes terminate early in resolution, without injury to the nerves, but it is more likely to pass into a state of subacute inflammation, which may last for months, as it is well or ill treated.

Neuritis is often mistaken for simple neuralgia, and only after the application of stimulating liniments, active muscular exercise of the affected parts, or other abuse of the inflamed nerve, does the true condition reveal itself.

Too often patients are told by the medical adviser that it is only a little touch of rheumatism, and he must exercise the part and not let it get seated. It is then that the real trouble begins.

We have all seen cases of mild neuritis, caused by such simple means as injury to the ulnar nerve, by one sleeping with the arm twisted under the head, so stimulated by a small faradic battery as to cause it to extend over the entire length of the forearm, involving the radial nerve to the extent that it could be found to be extremely sensitive over its entire length.

The pain of subacute neuritis is aching in character, and less distinctly follows the nerve tracts than does that of neuralgia. Like neuralgia, it is, however, liable to increase at night and have return of violence at fixed hours, although it is rather to be described as remittent than intermittent.

In neuralgia the pain is not increased by pressure, or if it is, it is only at certain points, and not over the whole nerve.

The primary effect of inflammation of a nerve is to render it more vascular, to enlarge and increase its vessels, and to cause a great development of connective tissue, which at first renders it less firm, owing to an effusion of serum within the main sheath and between the nerve fibers.

The prognosis of any case of long-standing neuritis should be given with caution and in proportion to the length of nerves involved and the extent of the morbid process.

The diagnostic value of electricity in neuritis is, as a rule, varied and uncertain, except where the degenerative changes are quite advanced and more or less atrophy and paralysis exists. During the acute and subacute stages, when the usual peripheral abnormal sensibility is present, electrical stimulation of sufficient strength might do possible harm, and the painful sensation thus caused will give an exaggerated idea of the true extent of the trouble.

When there is failure to mark the distinction in respect to

the seat of the lesion, whether central or peripheral, or when the structural changes in the nerves are such that local paralysis and even shrinkage of muscles are present, electricity is certainly of great importance in determining the true condition.

The treatment of the affection depends, first, upon its cause, and second, upon the stage of the disease. The cause being removed, the parts do not as a rule regain their normal functional utility, the same as repair would take place in other bodily lesions; the nerve or nerves involving the inflammatory process will require either sedative or stimulating treatment, according to the stages of the disease.

Most writers on this subject are very emphatic in proclaiming against the use of electricity in the acute stage, as unless one is familiar with the subject the careless or improper method of making electrical application is calculated to do much harm. On the other hand, with care and gentleness in the administration very mild currents of galvanism, using large electrodes stable, is productive of the most gratifying results. If, however, small electrodes of coarse material, like sponges for instance, are moved over the course of the inflamed nerve with the same mild current, muscular contractions are produced and the inflamed nerves irritated and the trouble increased. Therefore it is needless to say what would be the effect of faradic or static application.

In the treatment of an acute case of torticollis place an electrode high up on the neck and attach it to the positive pole, and with the hand and the forearm in water or covered with another large electrode connected with the negative pole, use not over 3 to 5 milliamperes for twenty minutes at each sitting.

The same principle would apply to the brachial, lumbar, and sciatic regions, only the amount of current used would depend upon the amount of distance between the electrodes.

In cases of long standing, when the pathological condition is one of chronic interstitial change, some form of electrical stimulation over the affected area is indicated, and it becomes a fine point to decide just when to begin this procedure, and how far one may carry it. We must keep in mind the fact that our object is to improve the nutrition of the part, and thereby hasten the absorption of the inflammatory products along the nerve trunk.

On the principle that chronic affections require persistent treatment, the application sometimes must be continued for months, and we are thereby often rewarded by obtaining great benefit even when the reaction of degeneration had been most marked.

The faradic brush, the coarse coil with slow interruption, and the interrupted galvanic current will benefit many cases in the advanced stage where the high tension current would be of no avail.

But in the subacute stage, where there still exists considerable active inflammation, the high tension coil, used with a weak galvanic current, is better than either of the extremes. However, in the majority of the cases of advanced degeneration, with or without local paralysis or muscular atrophy, the static machine is of the greater value.

In old, debilitated, and anæmic subjects, the seances should be, in my opinion, given frequently, in order to maintain the greater nutritional effect over the affected area.

Following the ideas and suggestions in the valuable paper before this association at our last meeting on the Morton wave current by Dr. Snow, I have applied it to a few cases with pleasing results.

I wish to repeat that in the use of galvanism for inflamed nerves, great care should be observed to avoid shocks where the stimulating effect is not desired.

Melrose, Mass.

#### DISCUSSION.

Dr. W. J. Morton said that he had listened to the paper very attentively because the subject was one which had interested him greatly for the last ten years. A large proportion of his practice consisted of cases of neuritis, and as far back as 1892 he had published some very pronounced opinions on the treatment of neuritis that had shocked some of his old neurological friends, and had brought down upon him very considerable criticism from the profession at large. The paper had been read before the Clinical Society of the New York Post-Graduate School. The point was made that no matter how acute and painful the cause of neuritis might be, he would distinctly advise that the sparks be directly applied to the painful area, and in sittings of ten, fifteen or twenty minutes, and that these be repeated daily. He had even gone so far as to say that he considered the application of the spark in cases of acute neuritis was as specific a treatment as the use of quinine in malarial

fever. He had never seen any reason to change that opinion. When the electric wave current had come into vogue attention had been directed to the treatment of these cases by that current. The effects had been about the same. His preference was still for the long, clean spark, but if the patient was unwilling to take it he would use, as his next choice, the wave current. He had made a collection of eighty cases within three years, and had published the duration of treatment, the kind of treatment, the immediate results, and the results after an interval of two years or more. There had been an extremely large percentage of cures, and the average period of treatment had been very short—four to six weeks. He had seen cases come into the office suffering excruciating pain. He was now referring to cases of so-called acute rheumatic neuritis. They had been taking whisky and large doses of morphine, and had the limbs in splints or wrapped in cotton wool in order to get some relief. They had not been relieved, however, by these measures, yet one treatment by the method he had just advocated had given immediate relief, and within a week they had been practically comfortable, and in two or three weeks had been fairly on the road to recovery. As a rule a cure had been effected in about six weeks. He believed such a result was impossible of attainment by any other method in electro-therapeutics. His convictions had been accentuated by comparing these results with those ordinarily obtained by neurologists in the treatment of this very painful yet very common disease. The general practitioner usually passes these cases as obscure rheumatism, not recognizing early enough the neuritic character of the pain. He had long, in this respect, had a quarrel with the rest-cure people, represented by the Philadelphia school, with which the name of Dr. S. Weir Mitchell is so famously connected. Their plan consisted in resting the painful parts in splints or plaster bandages, but he had pointed out in a recent article that the results of such treatment had often been in one respect dangerous. In eight or ten per cent. of these cases ankylosis of important joints had resulted. This was the great danger of the rest-cure treatment, to say nothing of the inefficacy of this method. Such treatment was simply an avowal on the part of the practitioner that nothing could be done—it was a let-alone treatment. The speaker went on to say that the attempt at cure should be as acute on the part of the physician as it was acute on the part of the disease. He had only one criticism to make upon the paper, which in other respects he considered admirable, and that was that the paper seemed to him to recommend too many alternatives—the faradic current, the mild galvanic current, and the stronger galvanic current. We should be as precise in our directions as the electrical engineer who spoke to us fifteen or twenty minutes ago.

Dr. G. Betton Massey said that many years ago he had been

an advocate of the rest cure in many nervous affections, but for a number of years he had been protesting against this method of treatment, particularly in neurasthenia. In the last edition of Dr. S. Weir Mitchell's book the treatment advocated for sciatica was the rest cure by the use of splints for the affected part. From inquiry made at the hospital where the treatment had been employed, Dr. Massey said he had become convinced that even the staff there, after a fuller trial, did not feel very strongly in its favor. The treatment of acute neuritis of the sciatic nerve was, in his opinion, a most difficult problem. The static spark, or even the static breeze, was useful in the chronic cases, but such treatment was impracticable for bedridden patients. He would suggest that in these cases a faithful trial should be made of the high tension faradic current, which can be readily applied at the bedside if need be two or three times a day.

Dr. W. B. Snow said that he was especially familiar with the treatment of sciatica. If he could have a bedridden patient brought to the office, after one treatment it would usually be a comparatively easy matter for him to get to the office for subsequent treatment. He has had some cases within the past year in which he had not been able at first to diagnose Pott's disease of the spine. He had located the lesion in the cord or in the plexus within the pelvis, and had been able to give some relief. Discovering the true nature of the trouble, treatment had been abandoned, for, of course, nothing further could be done by the electro-therapeutist for a neuritis dependent upon an accumulation or pus. Any other uncomplicated neuritis would, however, yield. For the first few days he often gave the treatment twice daily, but after this the application was usually given only once daily. If a relapse occurred between two treatments sufficiently to place the patient where he had first been, it was an indication that the interval between the treatments had been too great. He always paid great attention to the principle of "bridging." The administrations must be long if the wave current is employed. He had already treated and cured ten cases of acute sciatic neuritis by means of the wave current, the metal plate being placed over the seat of the neuritis. Each seance had been continued until the patient could leave the office without an ache or a pain on movement. This had been his uniform experience, and would be the experience of all, he felt certain, who gave the method a faithful trial. Years ago he had tried galvanism at the bedside in these cases, but he no longer employed the method because he had found that it was as a rule only necessary to have the patient carried to the office for one treatment of the static form. In a chronic case of neuritis in which the process had lasted a month or more the sparks were indispensable. Any physician to-day who had a case of sciatica under his observation and was

without a static machine should in justice to his patient refer him to someone who could give that treatment. This was certainly a rather plain statement, yet the records proved that there was no other treatment so successful for neuritis unless the case was very mild.

Dr. F. B. Bishop said that he regretted very much having to place himself on record as an old-time practitioner, but that he would insist that the galvanic current was most useful in both acute and chronic neuritis. If properly applied to the sciatic in a case of non-specific sciatica the pain could be relieved just as certainly with the galvanic current as with the static machine, and he had even succeeded when the static current had failed. He made use of electrodes having very large surface, so that the application could be made without causing pain, and generally directed the course of the current through the course of the nerve, putting the positive pole over the area of the hip and the other electrode at the popliteal space. The current was turned on very gradually until a strength of 50 or 75 m.a. was obtained, and then this was allowed to pass for about half an hour. In nine cases out of ten the patient would be relieved, and would remain longer free from pain than if the static machine had been employed. Of course, in cases of pressure neuritis it was necessary to relieve the pressure. Dr. Bishop then narrated two cases. The first had been operated upon for the removal of a tumor pressing upon the ganglion at the posterior surface of the wrist at the extremity of the posterior interosseous nerve. This had been done with the idea of relieving the pain, but instead of doing this the neuritis had been converted from a pressure neuritis into a traumatic neuritis. After the wound had been healed it was concluded that the filaments of the nerve had been bound down in the cicatrix. A second operation had accordingly been done and the cicatrix lifted from the bone and the nerve cut. The result was a more intense pain, and eventually the patient had been referred to him for electricity. The patient had been under his treatment for one year, and was still under his care. She was very much better, but would not be completely relieved until the nerve fibers had healed. He had used the fine vibratory current—not the wave current of Dr. Morton, for he had never been able to get a fine enough vibration from that current to avoid inflicting pain. The current he used was obtained by taking the ground from the opposite pole, getting the induction through the air. The patient would go to sleep in a very few minutes after the current had been started, and should be left sleeping for an hour at a time. During the summer he had used the galvanic current, placing the whole hand and arm in a pan of water for the negative pole and a large negative electrode over the cervical region. The pain had been relieved in exactly the same way, but the application

had been more inconvenient. The second case reported was the daughter of the physician who had operated upon the first case. The tumor was in identically the same locality, and the patient was a girl of fifteen years. She could not use the hand; an attempt at playing on the piano was very painful. No operation was done, but the patient was referred to him for electrical treatment. In the course of two months the tumor had disappeared, and with it the neuritis. No static electricity had been used in this case. Dr. Bishop said that he was very glad to hear Dr. Morton speak in so sanguine a manner about the result, but he personally would not have the courage to give the static spark to either a chronic or an acute case of neuritis. Such treatment was most severe. He was not questioning Dr. Morton's experience, but the method did not appeal to his judgment.

Dr. John Gerin, of Auburn, wished to add his testimony in favor of the static spark. He had always obtained good results in both new and old cases of neuritis by following out this plan of treatment. In cases of sciatica he would not consider it the only treatment, and it had not given him as good results as in other cases of neuritis. He had not used the galvanic current in the manner described by Dr. Bishop, and his experience had been that such treatment would aggravate the trouble. He had never used the faradic current in these cases.

Dr. T. A. Pease reported the following case: a man of about forty, was suffering from sciatica as a result of a slight traumatism. After various methods of treatment extending over nine months, including galvanism and faradism, the speaker said that the man had come to his office on crutches, having been sent there for the application of the galvano-cautery. This had been applied without result. The lower portion of the lumbar and sacral regions were very tender, and the whole length of the sciatic nerve was tender and the limb was swollen. The hip was thrown about two inches out of the median line. After two applications of the galvano-cautery the static treatment had been instituted. Not only the mild current and the brush current had been used, but he had finally used the Leyden jar sparks and current. In fifteen treatments, extending over seven weeks, the man had been completely cured, and a later report from him indicated that he had remained perfectly well and could walk long distances.

Dr. J. D. Gibson said that when one had to deal with a neuritis pure and simple there was nothing, in his opinion, comparable to the static machine and the use of sparks. In cases of neuritis of central origin, failure might be met with. In two cases of brachial neuritis coming under his care the cause had been axillary aneurism. One case he had operated upon and it had recovered, and the other case had been operated upon by a friend, and it had also recovered. Before the aneurism had

discovered he had used electricity, and had made the  
ents worse. He now had under his care a man with hemi-  
nia of the right side and a most troublesome neuritis. He  
ld like advice upon the subject. The patient was a man  
about sixty-seven years, and he suffered intense pain from  
wrist and the palm of the hand, and the pain was more  
use in the night. He could be relieved for about one hour  
the application of the sparks, and the same result could be ob-  
tained with the wave current. When the static machine had not  
ked properly he had tried a galvanic current, applying large  
ges to the side of the neck and shoulder and the sponge  
ile to the hand. On one day he had used 30 to 40 m.a.  
had obtained some relief, while on another occasion he had  
milder currents, but in all cases the relief had been tem-  
ary. In sciatica pure and simple, whether acute or chronic,  
referred to use a long, thick, and heavy spark. In every  
ance in which he had given a thorough treatment with the  
k the patient had been able to leave the office feeling com-  
able.

Dr. Josephine Davis of New York said that she had been  
successful in the use of the high tension current in the  
treatment of sciatica. One case was recalled in which she had  
treated a patient in Philadelphia with the primary current  
in a Kidder machine, making the application with one finger.  
The patient was suffering intensely at the time, but was able the  
day to come for treatment. Many similar cases, she said,  
d be cited.

Dr. Morse, in closing the discussion, said that he had made  
mention of various methods of treatment because not every  
practitioner of medicine had a static machine, and many pa-  
tients in private practice would not submit to the treatment ad-  
vised by Dr. Morton, even though it was best. The very  
long galvanic current suggested by Dr. Bishop he had never  
d to use.

## WHY I USE ELECTRICITY IN GENERAL PRACTICE.\*

BY A. W. BAYLISS, M. D., BUFFALO, N. Y.

In presenting some of my reasons for the use of electricity in general practice it is not my intention to enter into the discussion of any special treatment, but to generalize the subject. For the reason that there are those here who have made a professional life study of the subject, and it would be presuming too much on my part to attempt to say what should and what should not be done, I can only tell what has been useful in my hands.

In the first place I think one should try and teach the public more of electricity, that there is only one kind, but by certain means it is changed in form to suit our special needs. The laity generally think that each instrument represents some special kind of electricity. Also we should teach ourselves that it is not a cure-all, although each day widens the field for its use. It is to-day being used intelligently and with success in cases that a few years ago it would have been considered charlatanism to use it in. Do not misunderstand me now in what I am about to say. If there was nothing in electricity but the power of suggestion that we have over our patients, as I have heard some reputable physicians say, then the success derived from its use well repays for its application; even if we had no change in matter but mental. It is now a conceded fact that small, oft-repeated doses of medicine in most cases will act as well as two or three times the amount given in one dose. Therefore if we take a cell and see the chemical action from its use, see the decomposition of the different substances, the liberation of gases, etc., how can a person say there is no effect from its use except mental, when its action can be traced from the milliampere up to the cauterizing effect? But when you have a patient brought to the office in an invalid's chair, unable to take a step, and in three or four months improves so much that she gets on and off the street cars alone and walks several blocks without assistance; when the neurotic patient comes in with the usual attack of migraine which recurs regularly each month and after a dozen treatments has no re-

\* Read before the annual meeting of the American Electro-Therapeutic Association at Buffalo, N. Y., September 27, 1901.

ence for two years; when the mother brings her child with  
resis almost to the stage of incontinence and he is cured  
a few treatments without the use of a drop of medicine;  
n the patient comes to the office with an attack of ovarian-  
and you relieve it at once with the constant current—when  
e results are repeated in many cases and others of different  
s are improved, then I think it time that we induce the more  
eral use of so valuable a measure.

I think the reason that it is so little used is the lack of  
wledge we have of it, due to its not having been taught  
ur medical schools; though now, I believe, in some col-  
s it is taught to some extent. Secondly, to the unloading  
n the medical profession of some of the most useless ap-  
atus that it is possible to imagine. I speak from experience,  
ng been through the mill and know whereof I speak.

In the class in which I graduated there was not one who  
instructions in that university that taught him the difference  
ween a volt and an ampere, or the difference between a  
stant and an interrupted current. If we wished to apply  
means of relief in our practice and went to the dealer in  
goods and had to take his word, for all it was worth,—  
ch was but little, for he knows no more of the subject  
n ourselves,—we would be no better off. So our first ex-  
ience in the use of electricity must be a failure. How else  
d it be with a worse than useless instrument in the hands  
ne who knows not how to use either a perfect or an imper-  
apparatus? The only wonder is that there is not more  
n done with it than there is.

We must not allow ourselves or others to think that no harm  
come from the improper use of this agent. How many  
es has our brother surgeon pointed out the ill effect of its  
and with cause, too, in some cases.

When we can relieve the pain of a congested and inflamed  
y almost instantly by use of the high tension coil, who  
ld think of using the coarse coil with the slow interrupter,  
ch fails in such a case? Yet that is what has been done  
y times with the seven and a half dollar family battery.

ny person before using a battery should be well acquainted  
n the effect which it will produce, at the same time apply  
nly in properly diagnosed cases, and the proper form for  
a case.

We can do much with the static forms of application, much with the constant current, and much with the interrupted; but we cannot do it all with either one alone. Yet how many have a complete outfit in the office ready for use?

With neurotic and rheumatic cases I find the static of most use, not so much in purely rheumatic cases as where it is of a neurotic type. It acts as a sedative. In my hands it has not the curative action that it has in the case of nerve affections. I use it in goiter with the best of results, applying the tinfoil electrode direct to the parts with usually the static wave current. I also use the sparks in chronic gastric trouble with success.

I might go on telling how I apply the current and report cases that I have treated, but as I said in the beginning, I only intend to generalize; yet I would like to show some of the cases and the results obtained, but I must hasten, as I was going to say, to a very important branch of electricity, that is, the use of the X-ray in general practice.

I have some slides which I will show you. These negatives were not prepared for the purpose of exhibition, but for my own use; were developed by myself, and as you will see some are not what they might be had the work been done by a professional photographer. Those who have had any experience in this line will understand the difficulty under which we labor. Having had no instructions whatever, we have to work out the problem to the best of our ability.

I make but little use of the fluoroscope. It fails in my hands to bring out the parts as it should, so I make a negative, developing it at once; then I have before me something that can be studied at leisure and used for reference in case an operation is necessary. This all takes much time, and at times we think we will give it all up, but when we think of the satisfaction it is to see and not to guess at the condition, then we make new resolves and go on with renewed ambition.

## X-RAYS IN TUBERCULOSIS.

J. RUDIS-JICINSKY, A. M., M. D., M. E., CEDAR RAPIDS, IA.,

Secretary of the Roentgen Society of the United States; Member of the International Congress of Medical Electrology and Radiology, Paris, France; Member of the American Medical Association; Member of the third Bohemian Medical Congress, Prague, Bohemia; Western Surgical and Gynecological Association; Tristate Medical Society; Iowa Medical League, etc.

The usefulness of the X-rays in tuberculosis may be divided in five main divisions: (1) the early diagnosis of tuberculosis pulmonalis; (2) the treatment of tuberculosis of the skin, or lupus vulgaris; (3) the treatment of the tuberculosis pulmonalis in the early stage; (4) the treatment of the tuberculous affections of the joints, and (5) the treatment of other tuberculous conditions in other parts.

The early diagnosis of tuberculosis pulmonalis, and the absolute cure of lupus with the best results, are things which cannot be disputed any more. The other subjects are still in infancy, and not beyond the experimental stage. The first attempt to apply X-rays for therapeutic purposes was made by Freund, to remove by this means the hair from a nævus. Then came the unexpected accident on account of prolonged radiation, and soon it was found that the X-rays caused irritation, which had effect upon some bacteria of the diseased parts, where the bacteria habitate. The effect was of a marked electro-chemic character. The successful treatment of lupus vulgaris with the X-rays is the best proof of it.

In these cases, it seems to be fully demonstrated that the bacilli may be destroyed locally with the X-rays, or that some necrosis of healthy tissues caused by raying renders the parts unsuitable for the growth of the bacilli. As lupus is a tubercular affection and is curable with the X-rays, it seems to follow that tuberculosis of other parts should respond to the same treatment if proper raying of sufficient intensity be applied. If irritation, by attracting the blood and phagocytic white corpuscles destroys the bacillus tuberculosis externally, as in lupus, why not bring the rays into direct contact with those deeper parts, which the fluoroscope or the skiagraph marked as tuberculous?

The Crookes tubes, as we know, emit effective rays not only from the platinum plate, but also from the whole tube. These cross the cone of rays emitted from the platinum plate, and are similar in their active properties to the rays of light at the violet end of the spectrum. Under such radiation, though, the various bacteria react differently, according to the quality of the plasma of the liquid they contain. The radiant energy sent out from the tube is absorbed by various substances differently. If the absorbing material is so constituted that its atomic arrangement may be easily modified or changed, then the X-rays will produce a change in that absorbing material exposed. The living cells of tissue are composed of molecules, the atomic arrangement of which is not stable, and we know that radiant energy, in the form of X-rays, will produce certain changes in the living tissues, just like other rays of light or heat. But the X-rays will penetrate deeper and affect the cells of deeper layers, if necessary. If these cells are in pathological condition or if bacteria have attacked the tissues, we nearly always will find that the molecules of the diseased cells are more complex in their arrangement than the normal, and that such cells will act altogether differently under proper radiation than the normal ones. The chemical change produced in the molecules of the cells will destroy the diseased portions with the bacilli perhaps, and the destroyed tissues will be thrown off, giving nature an opportunity for repair.

Satisfied with my experiments on pure cultures, rabbits and guinea-pigs, I have in the last three years, with patients' consent, applied the X-rays to every case in the early stage of tuberculosis pulmonalis which I had or which was sent to me. Nearly all of these cases showed on X-ray examination slight haziness, indicating the beginning of tuberculous infiltration in the apices, and also the range of the excursion of the diaphragm during forced inspiration, materially limited. I have treated accordingly, attacking the seat of the disease, forgetting not the three most important factors—pure air, the temperature, and good hygienic surroundings. From twenty selected cases in one year one died with tubercular intestinal complication, another committed suicide after two sittings, two others did not improve, and the rest are doing comparatively well. To support the nutritional changes in the healthy parts of the lung tissue and to increase the metabolic exchanges I

gave static electricity alternately with X-ray exposures. The effect of the X-ray in our cases, with the results so far obtained, are very encouraging. It would seem to destroy the bacilli, or the pathological cells containing bacilli directly in the lungs, and the static electrization improves and restores nutrition, not only of a part, but of the whole. By such process of treatment the healthy tissue is kept immunized on one side, and on the other the further proliferation of the bacilli stopped. The majority of our patients improved, the bacilli disappeared from their sputum, and their night-sweats ceased. Now the patients have ceased to cough and say that they feel good and are restored to usefulness. But I would not like to say, after a lapse of nearly two years, that the cases were cured by the X-ray exposures only, for it may have been spontaneous cure in all of them, but they are certainly now well, and are feeling good, and also just as certainly had tuberculosis when our treatment was instituted. The employment of the X-rays in earlier cases of phthisis pulmonalis is therefore worthy of extended trial, just as well as in other tuberculous affections in other parts of the body. The results of further experimental work will perhaps show that radiant energy in the shape of the X-rays will in the near future have a decided effect upon other forms of pathologic tissues and cells aside from tuberculosis.



## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN,  
CONN.

Physician in charge Newhope Hot Air Sanitarium, Member American Medical Association, American Electro-Therapeutic Association, Roentgen Society of the United States, Connecticut Medical Society, New Haven County Medical Society, Yale Medical Alumni Association, etc.

## CHAPTER V.

RHEUMATISM—(*continued*).

Treatment.—The local application of hot air is usually sufficient in rheumatism. If more than one joint is affected as many as possible of them should be treated at once with as many separate apparatuses. The body treatment is frequently useful and occasionally necessary for removing the metabolic impairment from systemic toxæmia and debility, but for the routine treatment of the disease it is not necessary or as efficient as the local. These should be applied at least twice a day at a temperature of 400° F. for an hour, until soreness and pain in the parts have entirely disappeared. When the pain returns after the treatment the same may be applied again immediately. Usually fifteen or twenty minutes will entirely remove the pain from the most violent cases, and it remains quiescent for a variable period, ordinarily six or eight hours. By repeating the treatment whenever the pain returns the patient can be kept practically free from marked discomfort during the whole of his convalescence, the inauguration of which usually coincides with his first hot-air treatment.

Rest of the affected joint is always helpful, but not always absolutely necessary. Massage or other after-treatment is always unnecessary and usually interferes markedly with the patient's comfort, either immediately or shortly afterwards. The limb may be done up in absorbent cotton or flannel, but liniments or other external applications are usually uncalled for and useless.

Adjunctive Measures.—Salicylic acid in some form should always constitute the principal element in any anti-rheumatic treatment. There can be no doubt that it is as nearly a specific for rheumatism as any drug is for any disease, but because of its

irritative tendencies towards the stomach and kidneys and its depressing influence upon the heart, it sometimes so impairs metabolism, either general or local or both, that it destroys its own effectiveness by rendering impossible its ingestion in sufficient quantity. By the use of hot air, however, local metabolism is kept at its point of greatest activity, and assimilation is rapid and complete. Less of the drug is therefore required to be introduced into the general circulation, and less systemic disturbance ensues. As a matter of fact, when the proper salicyl compound is administered in conjunction with hot air systemic disturbance of any sort or degree is of extremely rare occurrence.

The selection of the salicyl is important. Those most worthy of consideration are aspirin, salicin, sodium salicylate, salophen, and methyl salicylate, and their desirability according to my experience is in the order in which they are named. Aspirin in doses of 4 or 5 grams per day is usually a perfectly effective anti-rheumatic, and very rarely indeed produces any irritation of the stomach or kidneys or depression of the heart. Occasionally slight tinnitus or heart-burn follows its use, and rarely a patient is encountered who cannot take it at all. Salicin is nearly as effective, but must be given in much larger quantities (10 to 15 grams daily), and the bulk is objectionable. Salicin has the advantage over all the others of being an excellent stomachic, and constitutes a most useful succedaneum to sodium salicylate when the latter drug has impaired digestion. It serves admirably to remove the gastric debility as well as to keep up the salicyl saturation of the blood. The gastric and renal consequences of administering sodium salicylate in full doses need only be mentioned in order to be appreciated, but in cases where it is tolerated no drug does better work. Salophen may safely be given in dram doses four times daily and does good analgetic work for a day or two, but in order to get a marked and sustained curative action large quantities are usually required, and then the heart is apt to suffer. It is, however, extremely valuable in some cases, and I shall refer to it again in connection with sciatica. Methyl salicylate is sometimes given by the mouth, but my experience has been that its use is better restricted to external application after hot air treatments with those patients who cannot take any of the others in sufficient doses per os. Three or four

thicknesses of gauze are laid smoothly over the joint affected, 5 to 10 grams of methyl salicylate soaked in it, and gutta-percha tissue wrapped around the whole and retained in place by a roller bandage. It enters the circulation by absorption through the skin.

It will, however, not frequently be found necessary to go beyond aspirin. This drug is not miscible with water, but by thoroughly incorporating it with an equal quantity of powdered sugar it may be suspended in the liquid, and is best given in this manner.

The practice of administering alkalies in this affection with or without a salicyl compound is a common one, but modern conceptions of the causation and pathology of the disease do not furnish a logical indication for it, and although it does no harm, I have never been able to convince myself that it did any good, and have abandoned it.

In chronic cases where pain is not a factor demanding immediate attention, it is well to precede the first hot-air treatment by two or three doses of the salicyl selected. We thus secure a preparatory saturation of the patient's system and the case progresses more rapidly thereafter. In acute cases, however, immediate relief of the constant harassing pain is imperative, and the hot air should be given at once.

The electrical currents usually play but a secondary part in the treatment of this affection when hot air is available. Occasionally a case is encountered, however, where a muscle remains sore upon movement after the attack has apparently entirely ended, and here a few applications of the negative pole of the galvanic battery over the complaining region will dissipate the trouble. When hot air is not at hand, however, they are extremely useful, and may be applied as follows:

**Static.**—Spray over the spine for its general tonic effect, and the brush discharge for from thirty to forty minutes over the seat of the inflammatory process for sedation, relief of swelling, and improvement of metabolism. As far as I know, Dr. William Benham Snow of New York City was the first to call attention to the striking effect of the brush discharge in acute rheumatism.

**Faradic.**—Rapidly interrupted current from long, fine wire coil passed directly through the tissues affected for sedation and improvement of metabolism.

galvanic.—Usually the positive pole over the affected tissue will give temporary relief from pain and should be tried but sometimes the polarities must be reversed to obtain result. We can tell which only by trying. In addition to sedative action the galvanic current exercises a curative influence upon the disease through its power of stimulating the metabolism. Its action in this direction is identical with that of hot air, but much less powerful. When the part affected is a hand, foot, wrist, or ankle, the use of a water-bath electrode in which the member can be immersed is much more effective. From 5 to 15 milliamperes may be used for from ten to fifteen minutes.

Franklinism is the most useful of the electric currents in rheumatism.

Rigid restriction of the diet within narrow limits in this disease is not of nearly as much importance as is ordinarily supposed. It should be governed by the manifest needs of the patient's economy and the effects of the unaccustomed conditions surrounding him as regards lack of exercise, etc., rather than by the mere fact that he has rheumatism. The disease has in the past been so inextricably entangled with lithæmic and syphilitic conditions that the diet has been made to assume an un-natural specific character. The patient should be fed as would a person sick with any other disease which had impaired his power of digestion and assimilation and whose muscular and nervous systems were weakened by fever and sluggish from want of exercise. If his digestive powers are equal to beefsteak he may be given him without fear.

As in every other general infection the bowels must be kept freely open, and salines are the best agents to employ for this purpose. Plenty of liquid in the form of milk (one quart per day), water—carbonated or plain, or lemonade are essential to the patient's best good.

Chronic rheumatism.—The treatment differs very little from that of the acute form. As pain is not so prominent a feature the treatments do not need to be repeated so frequently, and as there is less general metabolic impairment the response on the part of the patient is quicker and more complete. Electricity in the form of the static spark, static wave current, and magnetism, is always useful in conjunction with hot air, and when the thermal agent is not available forms the physical

means most to be depended upon. The drug treatment differs in no particular from that in the acute form.

Fibrous adhesions, so called, which are ordinarily looked upon as forming a prominent element in the pathology of chronic rheumatism, usually yield kindly but somewhat slowly to the absorptive influence of hot air. Personally my experience has been that true fibrous adhesion following true rheumatic inflammation is one of the rarest of occurrences, so much so in fact that when it is encountered as an alleged post-rheumatic lesion I think the diagnosis of the original condition should be subjected to close scrutiny. We may get an impairment of function due to plastic exudate which simulates very closely the graver condition, but it is not true fibrous adhesion. This hypothesis would account for the fact that the ankylosis in these cases is almost always but partial, and for the satisfactory way in which it responds to hot air. The agent removes the ankylosis due to confinement of a joint in a splint after fracture, for instance, which we know to be due to true fibrous adhesion, in quite a different manner from that following true rheumatism.



## RECENT ADVANCE IN HYDRO-ELECTRO-THERAPEUTICS.

BY DR. WM. MÜLLER.

It is essential in electric baths that a current of electricity, as nearly uniform in intensity as possible, flow over the entire surface of the body.

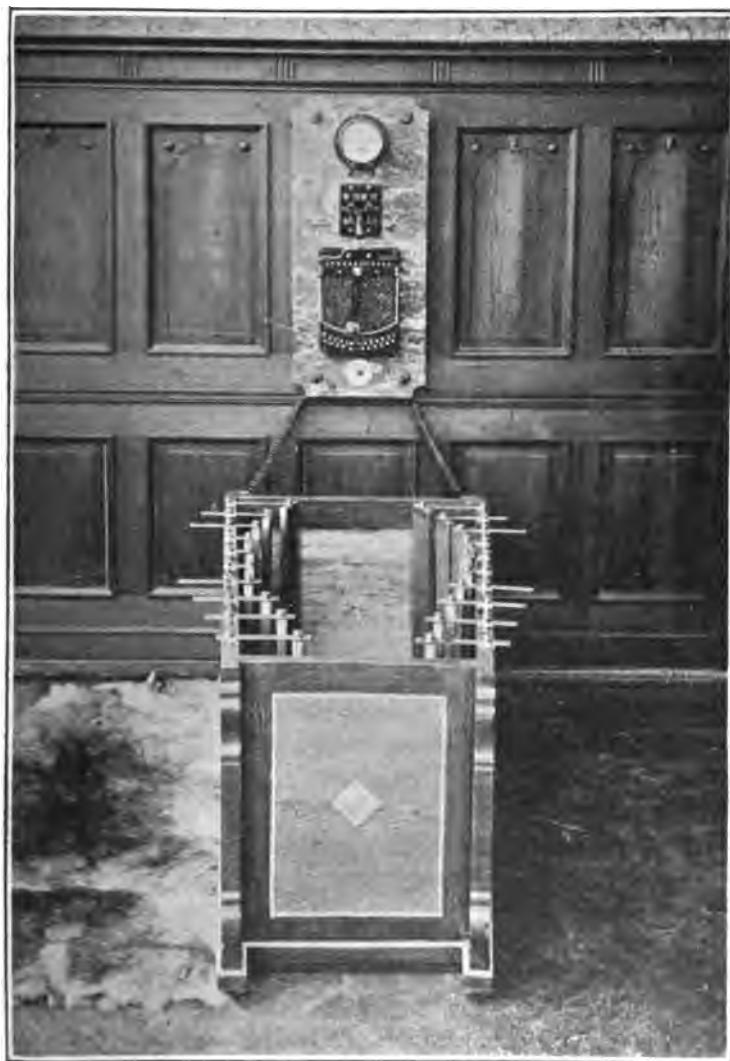
According to Gaertner it is generally unnecessary to localize the current within the bath, as is now done in some instances, with a view of treating some particular diseased portion of the body; this result may be more thoroughly and safely reached outside the bath, by the use of electrodes designed for the purpose. It has always been the first and chief aim in baths of this kind to reach the entire body surface covered by the bathing fluid, with a current equally intense throughout. Various means were employed to bring this about. It may be stated here, however, that this result cannot be considered an invariable desideratum in all cases, as the latest discoveries in the line of using water and the electric current as curative means (to which we shall hereafter refer), have shown that modification of this view is not only made desirable, but necessary.

In the old bipolar baths the endeavor to submerge uniformly all parts of the bather's body in the electrically charged water met with but indifferent success. These baths consist of tubs in which metal plates of various sizes and shapes were placed, the plates acting as conductors of the current to the bather. The great disadvantage and erroneous physical principle of this arrangement are found in the fact that a large proportion of the current is neutralized directly by the bathing fluid without coming into contact with the body of the bather. The water offers practically little resistance to the current, however, the resistance of the human body, when compared to that of the water, must not be considered light. It is thus that in bipolar baths of old construction, but an aliquot fractional part of the current penetrates the body, while another and greater part passes from the positive electrode, through the water, directly to the negative electrode. Wjasensky endeavored to determine the quantity of the latter part. He found that on an average two-thirds of the current is neutralized by the water. Hedley

(British Medical Journal, February 20, 1892), who was engaged in a like pursuit, decided that, at the most, one-fifth of the current entered the body. The value of such conclusions is not great, inasmuch as their determination depends upon many and in each case varying circumstances; *e. g.*, the conducting power of the water must be considered, the distance of the bather from the electrodes and other like conditions should be taken into account, and it would be necessary to repeat the somewhat difficult tests in each case to determine the actual potentiality. This kind of bath, as far as I know, is now but rarely used.

The unipolar bath, on Professor Eulenburg's plan, and the two cells bath as constructed by Gaertner, are almost exclusively employed at the present time. The unipolar bath, while otherwise embodying many advantages, is defective in that the current entering it through the immersed body of the patient must pass out through the latter's hands, which rest upon the pole. This defect is avoided in the two cells bath. It is characterized by a diaphragm or partition, which divides the interior of the tub into two almost hermetically closed cells. The zinc or copper tub is cut through at a third of its length, so that the metal connection between the two parts is interrupted. The diaphragm or partition which is placed in the middle of the tub is constructed of wood and asbestos, and is provided with a central aperture approximately the size of the normal human body, a caoutchouc lamella fitting about the circumference of the aperture. As a consequence of this construction the electric current, when passing between the two parts of the bath, is conducted only through the bather's body, and thus uniformly directed over the entire surface.

Owing to the fact that in the faradic bath no reddening of the skin results, as contradistinguished to the effect produced by the galvanic bath, it is to be concluded that the former is not adapted to cause a general and uniform stimulation of the skin, because the nerve trunks react before the peripheric nerves in the skin, whereas in a continuous current the reverse is the case. In the treatment of diseases wherein the nerve trunks should be directly affected by the current (*e. g.*, as in sciatica) this property of the faradic bath becomes useful. In general, however, the galvanic bath is most frequently employed.



In the galvanic bath a feeling of warmth pervades the entire surface of the body, or a slight prickling sensation is felt on the whole cuticle surface, this sensation never becoming unpleasant or painful when the intensity of the current is properly regulated. The galvanic bath further causes hyperæmia of the skin, its degree depending upon the duration of the bath and intensity of the current. It is indicated by a more or less intense reddening at certain places—for instance, at the neck and breast, being particularly noticeable at the thighs, and is often accompanied by an unpleasant itching sensation in persons of delicate constitution.

The electric bath is certainly adapted to produce suggestive impressions. The cures effected in cases of functional neurosis may frequently find an explanation in this fact.

Of greater importance, however, is the cataphoresis; *i. e.*, the power of the current to carry with it matter electrolytically decomposed, this practically without exception being carried from the positive to the negative pole. It having been proven some time ago that mercury, arsenosiderit, resorcinol, and lithium in sufficient quantities can be incorporated into the body by this means, the idea that other ingredients could, in course of time, be used through the medium of cataphoresis in electric baths was not far distant. This theory was carried into practice by Stanger, who in 1898 introduced tannin into hydro-electro-therapeutics.

The Stanger bath for the cure of gout differs from other baths in the bathing fluid employed and in the composition of the electrodes, and their size and arrangement. The bathing fluid consists of extracts of barks and herbs possessing curative properties, and of a certain percentage of tannic acid, the latter being eminently adapted to dissolve the uric acid deposits settled in the tissues and joints, and to excrete them through the kidneys. Tannic acid is much more effective and by far less expensive than lithium salt, which is recommended by Dr. Guillon, the French physician, for the same purpose.

Of not less importance than the bathing fluid itself are the means for conducting the electricity. Owing to the size, the shape, and the entire arrangement of the electrodes, it is possible to have the electric current affect all parts of the patient's body with a uniform degree of intensity. No part of

the immersed body is unnecessarily or painfully irritated, as frequently occurs in other baths of this kind.

The electrodes consist of a distinctive carbon mass, and are shaped somewhat like boards, reaching to the bottom of the tub. They are placed close together, covering the entire length of the longer sides of the tub, and thus present a large electrolyzing surface, making it possible to conduct an electric current, gentle in effect, and of uniform intensity from one end of the bath to the other, a result never heretofore attained. Further than this (and herein lies a great advantage of the system), the entire current or any portion of it may be directed to any desired part of the bath, *i. e.*, at any point where the patient requires a strong current such strong current may be had, while at other and more sensitive parts of the body the current may be diminished or entirely cut off. This is made possible in that each one of the many electrodes adjacent to the body, and all separately movable, may be caused to approach or recede from the body on the contact rails, and the electric current may be switched on or off, at will. In this manner, each diseased part of the body may be individually treated, as a current of any intensity can be made to traverse the desired surface of large or small area, thus making this, in the true sense of the word, a universal electric bath.

The surprisingly good results of the bath are facts founded on experience, and in view of the numerous medical certificates attesting thereto cannot be doubted. It is very much like the use of a number of medicines, of the action of which we are ignorant, but the results of which leave no room for doubt. All experiments prove that especially the metabolism and the nervous system are very favorably influenced by the Stanger electro-therapeutic treatment.

We can state as a fact that not only gout, but muscular and articular rheumatism, neuralgia, exudates due to pleurisy and peritonitis, asthma, bronchial catarrh, chlorosis, nervousness (also its consequent sleeplessness), and other diseases caused by disturbed assimilation and circulation are very beneficially acted upon by the Stanger method of treatment, and absolutely without the use of drugs or medicines.

Three health-giving agents are combined in this system, the warm water, the curative ingredients, and the electricity which, owing to its cataphoric action or power of moving liquids from

the positive pole in the direction of the negative pole, incorporates the matter contained in the water into the body. The proof of this lies in the fact that after repeated use of the bath skin eruptions appear (which shortly again disappear), and also in that the excretion of uric acid—the retention of which in the body causes the symptoms of disease—is increased by the baths, this being shown in the uric analysis. It is not to be expected, of course, that this or any other curative system can produce wonders, and particularly difficult cases or those of long standing require patience. The care in diet, so important to gout sufferers, is not rendered unnecessary by undergoing the Stanger treatment. But we can make this statement without hesitancy, in view of the numerous patients treated and the careful medical observation made: in the above described treatment we have a most valuable addition to our therapeutic knowledge, and a curative factor much in advance of any known medical remedies.

610 Park Avenue, Hoboken, N. J.



## **Editorial.**

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### **THE FINSEN LIGHT VERSUS OTHER METHODS OF TREATING LUPUS.**

is a well-established fact that the Finsen light is generally effective in the treatment of lupus. It is also well known those who are familiar with the method that to be effective sittings must be from thirty minutes to an hour and even longer in certain cases, besides many months are required before a successful termination can be obtained. The apparatus is necessarily expensive, and the cost of operating debars its use except with patients who can afford to pay well for it. On the other hand our confrères are obtaining equally good results in the employment of the Roentgen ray and even we benefit from the brush discharge derived either from the static machine or a high potential coil. With either of the latter methods the sittings are much shorter, the improvement more rapid, and the apparatus already in the hands of very many physicians is all that they require.

The practical tendencies of the American physician bid fair to place the profession in the lead in the employment of advanced methods as it has in the use of the X-ray in the treatment of cancer. An English contemporary, however, has recently said, that "In this matter" (the treatment of cancer by the X-ray), "America is following the lead of Europe." Be that as it may, if current medicine is an index of what is being done, the Americans are leading both in improved methods and the character of results obtained. So also will it be in adopting the most practical methods of treating lupus vulgaris.

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### **CANCER INVESTIGATION AND TREATMENT.**

AT no time in the history of the medical profession has so much interest been manifested in the study and treatment of the various types of sarcoma and carcinoma as at present. A movement has been recently instituted in Great Britain at the head of which are Lord Lister, Sir William Broadbent, and many others prominent in the profession, for the purpose of

"Organized Research in Cancers." It is proposed "to provide laboratories for special investigations into cause and any treatment which may be suggested from time to time for the prevention, treatment, and cure of cancer, and to arrange for the testing under proper supervision of any so called remedy for cancer."

An appeal is made to the able and generously disposed to donate a sufficient sum, which is placed at \$500,000, to carry out this most important work. The following comment is added: There are not a few to whom the donation of the sum required would be like the giving of a sixpence to a beggar, while the benefit to mankind would be incalculable.

It is the same assistance which is so greatly needed in New York at this time, when so much should be done to perfect the use of the X-ray in the treatment of cancer.

Already assurance is abundant that with proper methods we can cope with the malignant and advanced types of the disease. Opportunities for investigation, however, are not what they should be, and too few medical men appreciate the importance of the field and the results possible to be obtained. So wedded are some of our surgeons to the knife that they will not embrace the newer and often more effective method, and their opposition and influence, when exerted, is a powerful impediment to the progress of other methods.

Let some benevolent individual provide the means for perfecting the investigation now, and there are able physicians who will aid the researches—men whose influence can, when correct and successful methods have been demonstrated, advance them to immediate recognition.

The evidence already to a student of the employment of the X-ray is abundant assurance that it may be expected to meet the demands of most cases which come for treatment before a marked cachexia is present, or the patient's powers are wasted from frequent hemorrhages.

There are at present, however, very many details of method to be developed requisite to the adaptation of the radiance to special cases—to wit, the qualities of radiance and apparatus which require a definite and accurate study from the treatment of very many cases, which can only be done in an institution properly managed and equipped, where a large number of patients can be cared for or treated.

## **Progress in Physical Therapeutics.**

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### **GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.**

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### *Cataphoric Treatment of Cancer.*

This method, which involves the massive diffusion of nascent oxychlorides of mercury and zinc from amalgamated gold and zinc electrodes thrust into the tumor, as fully described in the Transactions of the American Electro-Therapeutic Association for 1900, has now been employed in 50 cases by one of the editors of this department with the following results: In 7 cases the patient succumbed during or shortly after the application; in 16 cases a cure was attained, in cancers mostly inoperable, attested by the patients remaining well for periods varying from seven years to one year; in the remaining 27 cases the results proved to be only palliative, owing to pre-existing metastases to internal organs.

The currents employed in most of the cases varied from 350 milliamperes to 1500 milliamperes for periods varying from one to three hours, under general anaesthesia, the exceptions being several slowly growing epitheliomas which were cured by repeated applications of small currents.

The treatment was adopted in most of the cases as a last resort, presenting a most unfavorable field for the test of the remedy.

G. B. M.

#### *Senile Degeneration of the Endometrium.*

In a communication to the St. Louis Medical Review of June 30, Dr. Augustin H. Goelet discusses the diagnosis and treatment of this condition.

The symptoms resemble in some respects those of cancer—there is an offensive discharge in a woman well advanced in years past the menopause, with an emaciated cachectic condition of the system, associated with which there may be a granular erosion of the cervix or about the external os and a history of more or less irregular bleeding. There will be impaired digestion, loss of appetite, insomnia, nervousness, cold extremities and a poor circulation, an itching of the skin not necessarily confined to the genitals, headache, particularly at the top of the head or below the occipital region, and backache referred to the lumbar or sacral region. There is a pent-up dis-

charge within the uterus which decomposes, and, when its presence in sufficient quantity sets up contractions and is expelled, it burns and excoriates the vagina and vulva, which will then become covered with red spots, especially if it is very acrid. The treatment which Dr. Goelet advocates is summed up in the one word, drainage, which he thinks is best obtained by the negative pole of the galvanic battery, 5 or 10 milliamperes for three to five minutes, just sufficient to cause relaxation and to allow the electrode to move freely through the canal. At first these applications may be extremely painful, but usually after the second or third no pain will attend them. They should be continued twice a week until there is no more diseased discharge to drain, by which time the irritation of the vulva and vagina is relieved. In his summary of Dr. Goelet's paper in The Canada Medical Record of January, 1902, Dr. A. Lapthorn Smith, from whom we quote, testifies to the success of this treatment in several of his cases, adding that he gives his patients an alkaline mixture at the same time, and applies the yellow oxide of mercury ointment to the vagina to protect it from the discharge until the latter has stopped.

It would seem to us that the role of the negative pole in the treatment of this condition involves more than mere drainage, valuable as this result is. Even ten milliamperes will do much towards the surface erosion of the morbid mucous membrane, while its value in stimulating reparative phagocytosis is incontestable. In one case in our hands we substituted cupro-mercuric cataphoresis on the theory that a local microbic invasion was the true lesion, with the best results, the patient, aged seventy-two, recovering quite promptly. This, of course, necessitated the positive pole, and the electrode was readily improvised from a copper sound with its active surface coated with mercury and the shank with sealing wax. The advantage of employing the positive pole is obvious when we consider the highly hemorrhagic nature of this obstinate affection, and the addition of a local sterilization process would seem to be advisable.

G. B. M.

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### LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

BY W. S. SCHEPPEGRELL, M. D., NEW ORLEANS, LA.

*The X--rays in the Diagnosis of Foreign Bodies in the Air Passages.*

The X-rays have become a necessary adjunct in the examination of foreign bodies in the air passages and esophagus. The examinations are usually more satisfactory in children in which the surrounding tissue is not so dense, and thus enables the outline of the foreign body to be more clearly marked—a valu-

able point, as foreign bodies are more frequently met with in children. The character of the foreign body is the most important consideration, owing to the different degrees of absorption of the rays by various substances. Metallic bodies give the best results, these being usually distinguishable with the fluoroscope with remarkable clearness. When the foreign body cannot be located by means of the fluoroscope, a skiagraph should be made, as this sometimes gives positive results when the fluoroscope has been unsuccessful.

The number of cases in which the X-rays have been successfully used in such cases are now so numerous that they no longer present any great novelty. The brief résumé of a few recent cases, however, will not be without interest.

A case is reported by Misini (*Corps estraneo nella trachea e nel bronco sinistro. Tracheotomia. Radioscopia. Gazzetta degli ospedali e delle Cliniche*) in which a child of three years had inhaled a plum-stone into the left bronchus. The attempt to examine the child by means of the laryngeal mirror produced such a spasm that tracheotomy had to be resorted to at once. An examination was then made by means of the X-rays and the foreign body located in the left bronchus. Two days later the foreign body was spontaneously expelled through the tracheal opening.

A case of a shirt button in the left lung is reported by Spiess (*Ein Fremdkörper in der Lunge, München. med. Wochenschrift*). The foreign body could be located by the X-rays, but all efforts to remove it were unsuccessful, and the patient died of pneumonia. The autopsy showed the button lodged in the recess of the lung.

The case reported by H. Longstreet Taylor (*St. Paul Medical Journal*) is of special interest, owing to the manner in which the foreign body was successfully removed. A girl of ten years had inhaled a tooth which had just been drawn by a dentist. The tooth was located by means of the X-rays in the upper bronchus of the left lung. As dangerous symptoms began to appear, injections of oil containing menthol and guaiacol were made into the trachea, and shortly afterwards the tooth was expelled during a paroxysm of coughing. W. S.

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## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

THE wonderful advance in the recognition accorded the employment of the Roentgen ray in the treatment of the forms of carcinoma and sarcoma during the past two months is most remarkable. Until recently but relatively few believed the statements of those who were in the position to demonstrate.

The current medical literature had been almost barren of reports, and not unfrequently criticisms appeared of favorably reported cases. At the meeting of the general section of the New York Academy of Medicine on the evening of March 6, if not prior, prejudice was vanquished and doubt overthrown. It was a notable occasion, and marked the beginning of a new era in the treatment of malignant disease.

The extremely modest paper of Dr. Francis H. Williams of Boston and the stereopticon display of some cases of superficial epithelioma cured by the rays was followed by one of the most animated discussions and exhibitions of remarkable cases by resident physicians ever presented. No better argument for the truth could be offered, and before no greater body of the profession to make certain the establishment of so valuable discovery.

What was noticeable was that all are obtaining favorable results in selected cases, regardless of the fact that marked diversity of opinion existed as to technique. The conclusions to be drawn from the statements presented may be summed up as follows:

I.—X-rays do cause the disappearance of various forms of sarcoma and carcinoma to a varying extent with various methods.

II.—That one authority would employ a tube provided with means of controlling the vacuum, employing it at a high vacuum, with either a coil or a static machine.

III.—Another would employ the tube and apparatus which would give the greatest volume of radiance (not essentially a high tube).

IV.—And still another would employ only a static machine and a very low tube.

It is a notable fact, however, that the report of cases that persisted and developed in spite of treatment were by those who employed low or medium vacuum tubes or in which the case was one of extremely rapid growth.

It is manifest that very much is still to be learned from a most thorough, accurate, and comparative analysis and investigation of the whole subject. If this is to be done in a thoroughly scientific manner and determined from the results of cases to be reported from numerous investigators, definite statements of quality of tube, character of apparatus exciting

the tube, and the relative amount of current employed must accompany the report. When coils are used the amperage employed is most difficult to determine.

With static machines the number of revolving plates and the spark gap backed by the tube are relatively easy for comparison between that style of apparatus. With coils, however, run as suggested by Dr. Morton, "actuated not too strongly," the quantity is cut down, and still the high vacuum tube excited if the coil has capacity. This plan, however, does not produce a great volume of radiance, but such approximately as is produced by a relatively small static machine. It is desirable that in the future care will be taken that reports are made with reference to details of all particulars of exposure, including apparatus, tube and method, distance from anode to person of the patient, length and frequency of exposure, as well as the previous history and microscopical diagnosis of the case.

At present, nothing will contribute so much to the scientific determination of the proper technique as the carefully noted results in large institutions devoted to the treatment of malignant disease, or one especially equipped for the purpose.

It is already a well-established fact that the radiance is not limited to superficial growths, but that abdominal and other deep-seated indurations and bone sarcoma yield in some cases and it remains for the future to define the limitations and determine the surgeon's relation and operative procedures, which undoubtedly will continue as a feature in the treatment. It is certainly worthy of suggestion that every case be exposed to the X-rays for a time after surgical operations.—[EDITOR.]

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#### *X-Ray in Treatment of Cancer.*

Dr. Kienborek of Vienna, Austria, advises for use of the X-ray in the treatment of malignant growths, "a medium soft tube placed just above the part to be treated, at a distance of from 15 to 20 c.m.," and suggests three plans of procedure:

1. Daily sittings with a radiance of slight intensity, lasting five minutes, continued until the first symptoms of reaction appear.

2. (a). Sittings with a radiance of medium intensity twice a week, until reaction begins to be manifest (about two weeks), or (b) three or four sittings with a radiance of medium intensity given on alternate days.

3. The normal exposure in one sitting and await reaction.

*The Treatment of Malignant Growths by the X-ray and a Provisional Report on Cases under Treatment.* By William J. Morton, M. D., of New York, in the Medical Record of March 8, 1902.

Prof. Morton reports remarkable results obtained in the treatment of eight cases, and closes with the following interesting suggestions and conclusions:

As to the quality of the radiation, namely, differences due to the degree of vacuum in the tube, undoubtedly great physical and therapeutic differences exist—probably much greater than we are now aware of. The low-vacuum tube, actuated strongly and near to tissue, can exert a destructive influence in burning and production of gangrene which a high-vacuum tube under similar conditions will not. I prefer a high-vacuum tube (vacuum equivalent to a seven-inch air gap), actuated not too strongly. The quality of the radiation from such a tube produces a blurred and “muddy” definition in the fluoroscope, or upon the photographic plate in contradistinction to the sharply-defined image of other conditions of the tube (“soft” and “medium soft”). The blurring is doubtless due to “diffusion” of the x-radiation after impact within tissue.

But as to the choice of a “soft,” “medium soft,” or high-vacuum tube, practice must differ according to the case to be treated. Superficial growths, with no intervening sound skin, may be treated by a soft or medium soft tube, while internal growths, covered by sound skin, are more safely treated with the high-vacuum tube. This is not to say, however, that a superficial growth may not be treated by a high-vacuum tube, and this, in fact, is the method I would at present advise.

It is necessary to emphasize here the great caution required to administer enough of the X-ray, without burning, or injuring to the extent of gangrene the patient's tissue, and yet enough to cause retrogression of the new growth.

The treatment is a hazardous journey between Scylla and Charybdis.

Uncertainties and Dangers.—1. The absence of definite measure of the “dosage.” 2. The possibility of a “burn” or of gangrene. 3. The difficulty of ascertaining when the “danger point” of administration as regards burning and gangrene is reached.

Conclusions.—What is accomplished by the X-ray? 1. Relief from excruciating pain and constant suffering, often immediately. 2. Reduction in the size of the new growth. 3. Establishment of the process of repair. 4. Removal of the odor, if present. 5. Cessation of the discharge. 6. Softening and disappearance of lymphatic nodes. 7. Disappearance even of lymphatic enlargements not directly submitted to treatment and often quite distant. 8. Removal of the cachectic color and appearance of the skin. 9. Improvement in the

general health. 10. Cure, up to date, of a certain number of malignant growths.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

### *Sensitized Paper vs. Plates.*

The advantages of sensitized paper over plates in X-ray work can be readily seen when you realize that in looking at a photographic negative those who are not familiar with a negative image as a plate presents have great difficulty in recognizing



Skiagraph taken upon Sensitized Paper. Exposure five minutes, medium tube,  
Van Houten & Ten Broeck Static Machine.

detail, then the necessity of taking a "print." Breakage is an item not to be overlooked—wasted material, time, and energy. The price of paper is from forty to fifty per cent. lower than the cost of plates. The facility with which the sensitized paper picture may be stored with the necessary data written on the back, difference in bulk and weight, is self-evident.

By exposing the required number of sheets we can obtain as many prints of the same object as desired. The paper itself offers no obstruction to the X-ray; we can therefore expose a dozen sheets as readily as we could one.

We think the greatest advantage is the rapidity with which we can obtain the desired information. Those who have had any experience in X-ray photography know how important it is to obtain the results of the exposure. You also know that the plate in process of development is not always the most reliable source of information, so that under ordinary circumstances we are obliged to wait until the plate is sufficiently fixed to be transparent. Not so with paper, after proper development and thorough rinsing in water; the resulting picture may be examined in daylight without any appreciable damage, and the necessary fixing may be done later.

There are of course drawbacks and defects in paper at the present time. The difficulties are being gradually overcome, and we trust ere long a paper will be placed in the practitioner's hands that will be a quick, ready, convenient, and less costly means of producing X-ray data, so that the busy man can do his own photography and see the results on the spot.

Thus far the most satisfactory results we have obtained have been from the Eastman enameled permanent bromide paper. The image being a positive, the denser structures, as bone, appear white, as shown in the accompanying cut.

The time of exposure is longer than that of the plate, owing to the "slow" emulsion, but if the manufacturers have a demand for "quick" papers they can and will supply the market. The paper in developing requires no special manipulation, simply expose, develop, fix, and wash.

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*What Reliance can be Placed upon the Image Produced by the X-Ray from a Medico-Legal Standpoint?*

Charles Lester Leonard, A. M., M. D., of Philadelphia, in American Medicine of January 25, 1901, says that the reason that so-called fallacies and errors have been found in this method, making it necessary to discuss its accuracy, is that as a method of diagnosis it has been intrusted to persons deficient in that professional education that is essential to the accurate employment of any method of diagnosis.

The pictures made by lay operators have been accepted as valuable clinical data, and read, often incorrectly, by those

who did not know how they were made. Can the medical or lay public be blamed for doubting their accuracy, or for believing that they can tell as much by this new method of examination as the members of the profession?

When the medical profession realizes that this is a method of diagnosis, and utilizes it as such; that it can be correctly employed in diagnosis only by a professional man, especially trained in its use, they will begin to derive from it the aid which it is capable of affording. Errors will be much less frequent when the diagnoses are made by professional men, expert in this method. The laity will then realize that they are incompetent to read, appreciate, or criticise surgical conditions shown by it.

It is not to be supposed, nor is it advisable, to employ the Röntgen method in diagnosing of fractures to the exclusion of all other methods. All the means at command should be employed. The Röntgen diagnostician is not infallible. Other tissues than those this method recognizes may be injured and their lesion, unless recognized, may result in greater functional liability than arises from the injury to the bone. This method should not, however, be relegated to a secondary position. Greater detail and more accurate knowledge can be obtained by it than by any other method, with less pain to the patient, and less devitalization of the tissues surrounding the lesion, and less depression of the recuperative and reconstructive forces.

Expert work and expert opinion are alone valuable in cases of doubt in any field of diagnosis. This is especially true of the Röntgen diagnosis.

The value and accuracy of the Röntgen ray image in medico-legal cases is entirely dependent upon the experience and professional skill of the expert who made the skiagraph and translated it. The results of this method of examination are comparable with those of any other mechanical process of observation when human skill is demanded of the expert in the accurate employment of instruments of precision and the interpretation of their findings. These elements render the accuracy of this method very great, but it cannot be infallible, as accuracy in making the observation and expert knowledge in reading the diagnosis are essential. It has the advantage, however, of producing mechanically images that can be compared with the normal often in the same individual. These images can be duplicated by other experts and their meaning discussed. It is necessarily secondary or opinion evidence, but founded on tangible data.

The errors and vagaries attributed to this method of diagnosis are the result of a lack of knowledge in interpretation or skill in employing the rays. In the development of a new method of physical diagnosis, the errors should be steps by which knowledge is gained, and should not be held up as

stumbling blocks. Their recognition and avoidance in the future mark the path of accurate progress. The mistaking of normal joint and epiphyseal lines for fracture lines, or epiphyses for fragments, and the holding up of such mistakes as attesting the inaccuracy of this method is an index of the caliber of the critic. A knowledge of normal and pathologic anatomy, as viewed with the X-ray, is presupposed in the expert employing the Röntgen method of diagnosis, and inexperience is but a poor excuse for such errors, or the attributing of them to an accurate method.

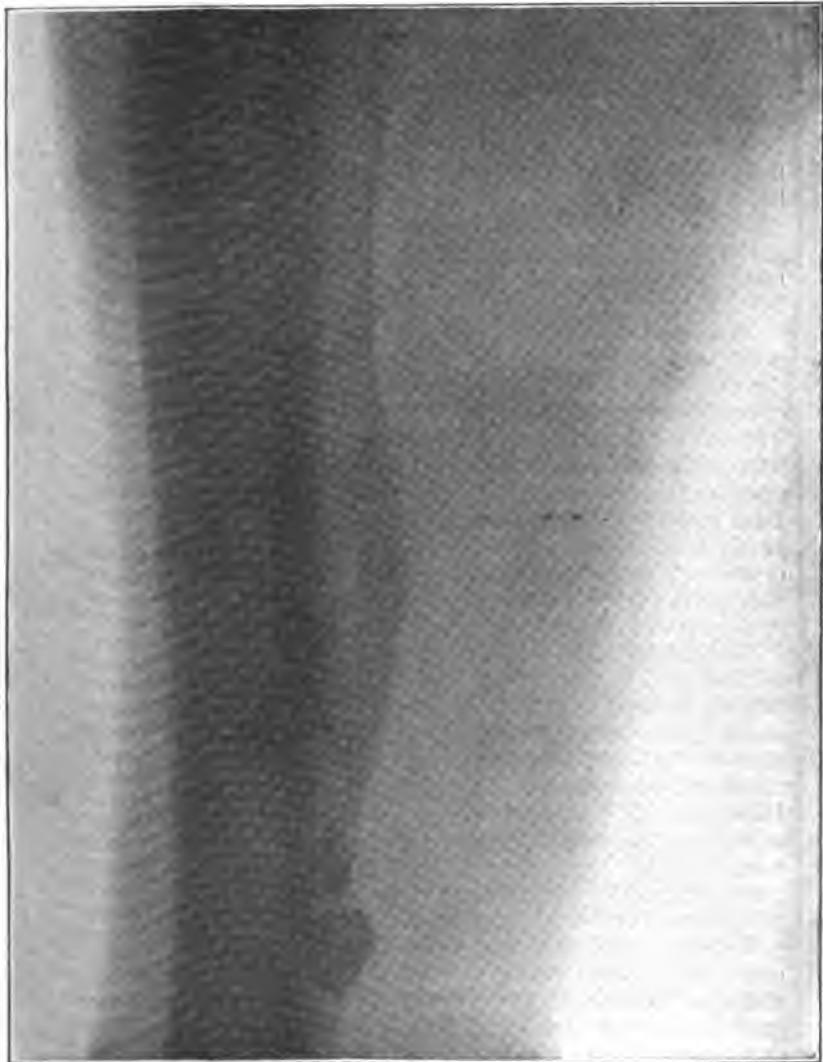
One of the most valuable uses of this method of diagnosis is in determining the success which has followed attempts at reducing and setting fractures, and the efficiency of fixative methods employed. The questions that immediately present themselves are : What degree of accuracy in coaptation should be expected ? Does the accuracy of this new method of diagnosis demand of the surgeon more accurate results, and how are they to be judged ?

It is unreasonable and improper to demand of the surgeon more accurate results unless he is afforded a better opportunity to treat the injury. Unless this opportunity is afforded, a union which re-establishes the functional efficiency of the injured bone, commensurate with the severity of the injury that has been received, is all that should be expected. The Röntgen method of diagnosis has frequently shown that, in cases in which perfect function has been restored, there may yet be asymmetry in the outline of the bones, and even an entire absence of apposition between the fractured surfaces.

Other questions that must be considered in studying the accuracy of this method are : Is it possible to miss seeing a fracture ; to see a fracture when none exists ; to show a fracture as persisting though long united ; to intentionally or unintentionally produce distorted images ?

The ability and experience of the operator are factors that must be taken into consideration in answering all these questions. Undoubtedly fractures can be overlooked by those defective in the technic essential to the exclusion of fractures, or by the inexperienced in reading the skiagraph though it shows the fracture. When, however, a skiagraph can be obtained that shows the cancellated structure of the bone or the medullary cavity of the long bones in contrast to their walls, the expert will have no difficulty in detecting a fracture, or in excluding all fractures.

There are yet certain portions of the body in which such accuracy cannot be obtained. The motion of the ribs, and the density of the body and skull, prevent our recognition of fractures in certain bones, notably of the spine and skull. The development of technic and further progress in instantaneous skiagraphy will probably overcome these difficulties. The



Skiagraph by Dr. James H. Kinnaird of Lancaster, Ky. Fracture and perforation of fibula by bullet, small fragments of which are seen along the tibia, which was traversed for three inches. Taken with eight-plate Van Houten & Ten Broeck Static Machine. Tube, Green & Bower. Distance between anode and cathode, three inches. Soft tube. Exposure, thirteen minutes. Seed plate No. 26, single coating. Developer, Eiko pyoro. Aristo platino paper.

method cannot be considered inaccurate because it is incapable of universal application. The accuracy that is attainable shows what will be accomplished by later developments.

The determination of the persistence of non-union is practically impossible unless a displacement of the fragments is produced that can be detected by the skiagraph when two taken at different times are compared. The opacity of bone is dependent upon the presence of the earthy salts. Callus may be firm and union present long before the deposition of these salts makes the callus opaque to the X-ray.

Distortions can be produced in this form of expert testimony as well as in any other. They can be readily recognized by the expert and proved by subsequent examinations.

Skiagraphs that are to be submitted in evidence should be made with great care. The point at which the tube is perpendicular to the plate should be marked by the shadow of an opaque object, as the lead wafer of a localizing apparatus. The identity of the picture can be established by using lead letters placed beneath the limb so that their shadows are cast upon the plate. It is thus impossible to erase or alter them. Data as to time, length of exposure, distance of tube, etc., can be written in ink on the plate when dry and signed by the operator. Any attempt to alter the writing or to manipulate the plate, except locally, is thus prevented, as the ink would otherwise run and destroy the plate.

Skiagraphs may be introduced as evidence for a number of purposes. To prove or disprove the presence of a fracture alleged to have been the result of accident or negligence. To show the extent of an injury that has been received in reference to the bones or their displacement. To show that proper treatment was or was not employed in suits for malpractice. Here also they may be of use in showing the extent of the injury and the insurmountable difficulties, in the way of treatment ; or that the functional disability resulting was due in a great measure to the nature of the original injury, and was to be expected and could not be obviated by treatment.

Taken immediately after the fracture was set they can be employed to prove that the fracture was originally reduced and that the resulting deformity and disability followed, and may or may not have been due to the negligence of the patient, as shown by other testimony.

Whenever a skiagraph is introduced as evidence, an expert opinion should be had by both sides, and, if necessary, an examination of the patient by this method should be demanded by the opposing side. This is essential that the true value of the skiagraph in all its bearings upon the case may be brought out ; as noted above, it will often show how great the injury has been and how difficult to treat, as well as showing the results of treatment.

Things will undoubtedly not be what they seem if in medico-legal work any but skilled professional operators and experts in this method of diagnosis are called upon, either to make the examination or translate the diagnosis. He must be more than well acquainted with X-ray work ; he must have made the skiagraph and understand the technic of its production, to be able to interpret it and be capable as an expert. His professional education and experience must be sufficient for him to appreciate and translate correctly the pathologic conditions that may be shown by the skiagraph. Neither lawyer, photographer nor a professional witness is capable of correctly reading the evidence shown in the skiagraph. The professional man who has by careful scientific study and clinical experience mastered the technic of this method of diagnosis and knows the errors that can be made, as well as how to employ it accurately, is the only person competent to give testimony.

These skiographs have been admitted as evidence and will be employed very frequently. When due care is given that they are made by competent professional experts and are fully explained, their importance in expert testimony will be very great, as their mechanical method of production assures a degree of accuracy that can be attained by no other method of diagnosis.

By a decision of the court (*Jameson v. Weld*, 45 a 299 ; 93 me. 345. American Digest 1900 A Aug. to Mch.) "it is within the discretion of the trial judge to admit in evidence an X-ray photograph ; and his determination of whether it is sufficiently verified, appears to be representative of the object portrayed, and may be useful to the jury is not open to exception."

This clearly defines the position which the courts have assumed in reference to this method of diagnosis. The profession must see to it that this evidence is only given by expert, reliable professional men. Its true value and accuracy will then be evident.

This method of diagnosis should not be feared, but courted for the scientific aid which it is capable of giving in the treatment of fractures. A more accurate method than any other, and capable of rendering the greatest service by demonstrating the value and efficiency of the methods of treatment, its employment should be demanded wherever it is feasible.

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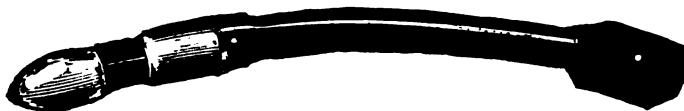
## DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D., BOSTON, MASS.

### *A new Rectal Electrode.*

On looking over the catalogues of the various instrument manufacturers I could not find a suitable bipolar rectal electrode. They are all more or less painful to insert, and being

straight—for what reason no one knows, unless its cheapness to manufacture—they are also more or less painful after insertion and capable of being inserted but a short distance, having a long straight stick always in the way of both patient and doctor. I felt something different was needed, so devised a new bipolar rectal electrode similar to the vaginal bipolar electrode, but curved to accommodate itself better to the anatomical conditions. Anyone who has to make frequent use of rectal electrodes knows that a curved instrument is more easily inserted into the rectum and after insertion is more comfortable for the patient. The cut below will give the best idea of the instrument.



The above cut is one-half size.

- A*, a cone-shaped tip, 1 inch long and  $\frac{7}{10}$  inch diameter.
- B*, rubber band insulating *A* from *C*.
- C*, metal band  $\frac{1}{8}$  inch wide and same diameter as the cone *A*.
- D*, ivory plugs to designate the connection with the band *C*.
- E*, curved shaft.
- F*, base with holes for insertion of cord tips.

The depression of the insulating band gives a better contact surface to the metal, the same as in the bipolar vaginal electrode. The connection of metal and rubber insulation is perfect and free from cracks and easily kept clean. The extreme length is seven inches, which makes it easy of manipulation. The instrument can be used with the sinusoidal and faradic currents, which are especially effective when using the slow vibration as a tonic treatment for prolapsed or relapsed walls of the rectum. The electrode can be made of copper or zinc in order to get the cataphoric effect of oxychloride of copper or zinc by using the galvanic or continuous current. I have two sizes, the larger one, as described above, being 70-100 of an inch diameter, and one smaller being 50-100, for children, or where too much pain is caused by the insertion of the larger electrode.

*Esophagoscopy, Gastroscopy and Celioscopy.. Münchener med. Wochenschrift, January 7, 1902.*

The instrument which Kelling uses for endoscopy of the alimentary canal is constructed on the principle of his little finger, he remarks, only instead of three joints the instrument has twenty. Like the finger, it is covered with a soft sheath of rubber. The introduction into the esophagus or stomach of this flexible tube is no more aggressive than the introduction of the stomach tube or sound. After it is in place, a stiff guide

is worked into it, as the success of endoscopy of this kind depends on bringing the mouth and esophagus into a straight line, which is easily accomplished. The incandescent lamp and lenses are then introduced with a spiral motion imparted by a wheel above. The gastroscope differs from the esophagoscope only in that the lower end is bent at an angle to keep it away from the posterior wall of the stomach. The chief value of endoscopy is the early differentiation of carcinoma and the removal of foreign bodies. He relates a number of instances in which this differentiation was of inestimable benefit. In four cases in which the symptoms suggested incipient malignant disease, endoscopy revealed the integrity of the organs and indicated the nervous origin of the troubles or located them in an adjacent organ. In other cases it revealed a diverticulum, a syphilitic ulceration or mere spasm. In one case in which it established spasmodic contraction as the cause of the troubles, several physicians had previously diagnosed the case as carcinoma. For endoscopy of the abdominal cavity he first anaesthetizes with Schleich's solution; then inflates the cavity through a Fiedler trocar and then inserts the smallest sized Nitze cystoscope through a second trocar. The viscera can thus be seen and palpated under the eye. This method of celiotomy is aseptic, free from pain or danger and can be applied "ambulant."

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*Fissure of the Anus Treated by High Frequency Currents.*

Journal des Praticiens, August 31, 1901.

Zimmern and Laquerrière have produced a rapid cure of fissure of the anus in four cases treated by electric currents of high frequency. The electrode is introduced into the anus the length of the fissure and the current is continued for about four minutes. Pain is greatly lessened after the first treatment, stools are less painful and the fissures heal rapidly.

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## CONSTITUTIONAL DISEASES.

EDITED BY FRANCES H. BISHOP, M. D., WASHINGTON, D. C.

### *Ozone as a Therapeutic Agent.*

Notwithstanding the fact that we are informed by bacteriologists that ozone does not destroy the tubercular bacillus, and some say that ozone is not a germicide, we have abundant clinical evidence as to its therapeutic value, not alone in tuberculosis, but in all chronic pulmonary disorders, as well as in anæmia, chlorosis, and other conditions accompanied by an impoverished condition of the blood. In the *Bulletin Officiel de la Société Française d'electro-therapie et de radiologie* for

April, 1901, a very interesting and instructive article is presented by Dr. Labb  , who in collaboration with Dr. Oudin, has shown by spectroscopic and microscopic examinations that ozone has a decided and specific action upon the oxyhemoglobin and upon the red corpuscles in those diseases mentioned.

Case I.—Pulmonary Tuberculosis. Man, thirty-two years old; came under Dr. Labb  's care at the H  pital Boucicault October 1st, 1900. His trouble began in May, 1899, as a bronchitis, but the patient noticed that some months previously he had lost weight, and coughed a little in the mornings. One hemoptysis six months ago. He is feeble, has night-sweats, and dullness on percussion in apex of right lung, prolonged expiratory blowing sound, and abundant small mucous r  les. Exaggerated broncophony, etc. His weight before this illness had been sixty-five kilos; and his treatment up to December 1, 1900, consisted of country air, cod liver oil, creoste and cocodylate. Examination of the blood shows:

Spectroscopic.....	70 . 0
Red Corpuscles.....	2,500,000
Weight.....	51 kilos

Commenced immediately inhalations of ozone, fifteen minutes' duration, three times a week.

November 9. All symptoms point to decided improvement. Examination of the blood:

Spectroscopic.....	90 . 0
Red Globules.....	3,300,000
Weight.....	61 kilos

November 20. Still further improved. Examination of the blood:

Spectroscopic .....	110 . 0
Red Globules.....	4,500,000
Weight .....	52 kilos

November 25. The patient has taken cold, and the mucous r  les are augmented in upper part of right lung; the other symptoms are stationary.

December 5. General state excellent, hardly any cough or expectoration, no night-sweats. The signs of bronchitis have entirely disappeared. Some mucous r  les in right lung; expiration prolonged.

Examination of the blood:

Spectroscopic.....	120 . 0
Red Globules.....	4,700,000

The patient had improved so much that he discontinued his treatments in the hospital, and carried them on at his own home, where he had an apparatus installed.

**Case II.—Chloro-anæmia.**—A girl sixteen years of age, who has grown very rapidly, changed at thirteen years of age; always irregular, September, 1900, she commenced to complain of fatigue in the legs and shortness of breath when she climbed the stairs, palpitation and dizziness, very frequent vertigo that caused her to fall, very irritable, and excessively melancholy; constipated, no appetite. October 5 the patient presented herself to the Hôpital Boucicault. All the mucous surfaces very pale, the tegument of a greenish yellow. Pulse 100, small and irregular; migraine and vomiting.

Examination of the blood:

Spectroscopic.....	60	0
Red Globules.....	3,700,000	
Weight.....	37	kilos

Inhalation of ozone, fifteen minutes' duration, three times a week.

October 9.—General improvement. Examination of the blood:

Spectroscopic.....	61	20	0
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October 20.—The vertigo has disappeared, appetite good, constipation amended.

November 8.—Examination of the blood:

Spectroscopic.....	80	0
Red Globules.....	4,060,000	
Weight.....	37	kilos

November 27.—Examination of the blood:

Spectroscopic.....	91	20	1
Red Globules.....	4,200,000		

December 5.—Examination of the blood:

Spectroscopic.....	101	20	0
Red Globules.....	4,350,000		
Weight.....	42	kilos	

The patient was cured and ceased treatment.

**Case III.—Anæmia and Lead Paralysis.**—Married woman, aged twenty-five, commenced treatment September 27, 1900, by inhalations of ozone.

Examination of the blood:

Spectroscopic.....	50	0
Red Globules.....	1,500,000	
Weight.....	50	kilos

The treatment, fifteen minutes' duration, three times per week.

December 5.—Examination of the blood:

Spectroscopic.....	.....	.....	130	0
Red Globules.....	.....	.....	5,200,000	
Weight.....	.....	.....	59	kilos

Patient cured.

We are not informed in this article how the ozone was generated for the treatment of these cases, but take it for granted that it was generated by the action of a static machine or some other high tension, high frequency apparatus upon the atmosphere.

F. B. B.

## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

The Cleveland Journal of Medicine for December, 1901, has an article on "The Cystoscope: its Diagnostic Value in Diseases of the Genito-Urinary Tract," by Charles G. Foote.—The history of the cystoscope is given by Foote, who prefers the Berlin pattern of instrument. He considers cystoscopy usually an easy and safe method of diagnosis which should be made in every obscure case and by it the presence of disease in one or both kidneys can be determined in almost every instance. Hence, its value as a preliminary to operation on the kidneys, since it renders the differential diagnosis between vesical and renal disease comparatively easy.

In the International Medical Magazine, New York, for January, 1902, we find "Fistula in ano, its Relation to Phthisis," by Samuel G. Grant.—The differential diagnosis of fistula in ano in its simple type from its tuberculous form is described by Grant. Tuberculous fistulæ are usually secondary to intestinal ulcer caused by tuberculosis of some other organs, as the lung. Non-tuberculous fistulæ frequently occur in phthisical subjects also, due to emaciation, proneness to suppuration from slight causes and the result of bruises of the parts. The chief diagnostic points are the appearance of the rounded and elevated openings of the non-tuberculous forms, rounded buttocks, normal hair, nails, face, ears, and nose and voice; discharge is slight and yellow instead of profuse and watery or whitish; greater pain is caused by the introduction of the probe; lack of complications of cough or hemoptysis, tight sphincter as compared with patulous anus in the tuberculous, and the absence of tubercle bacilli.

The American Journal of Surgery and Gynecology, St. Louis, for January, 1902, publishes "Endovesical Surgery, with Special Reference to cystoscopy and Ureter Catheterism," by F. Kreinl.

*The Radical Treatment of Ischuria, due to Prostatic Hypertrophy, by Means of Rectal Cauterization of the Prostate.*By Dr. Angelo Negretto, in *Reforma Medica*.

The author devised this method of treating hypertrophied prostates in 1895, and has since tried it in a number of cases. The present article contains the results obtained in his last series of ten cases. He prepares the patient for operation by the administration of a purgative and a mixture of bismuth and opium. An hour before the operation he administers several enemata of glycerin. General anaesthesia is then administered, the patient is placed in the position used in perineal cystotomy, with elevated pelvis, and the rectum is stretched with a Weiss speculum and the upper part of the rectum is packed with gauze so as to protect the operative field. The special point for the Paquelin cautery, which the author has specially devised, and which is provided with a scale enabling the operator to control the amount of tissue destroyed, is now introduced until it reaches the middle of the rectal surface of the prostate. The extent and depth of the cauterization depend upon the size of the gland. The operation lasts, on the average, two minutes, and ten or twelve days later the catheter is withdrawn permanently and the patient urinates spontaneously. In nearly every case the method described has effected a speedy and complete cure of the hypertrophy and of the urinary obstruction, according to the author. Only in one case was there no improvement, that of a man with an enormous prostate and severe vesical complications. The method outlined is directed especially against the congestive element of prostatic hypertrophy, and is useful particularly in those cases where this element plays a great rôle. It has the advantage of not interfering with the generative functions.

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*Staining Urinary Sediment with Alizarin Sulpho-acids.* Centralblatt für innere Medicin, January 4, 1902.

Dr. R. Knapp says that, using the sulpho-acid salts of phthalic acid, he has obtained exquisite pictures of the mucosa of the bladder in normal urine, but that in diseased kidneys or pelvic renal disease, the mucosa did not stain at all, or at best, in a cloudy, stringy manner. Granular casts appear yellow, hyaline casts with a faint violet color. Among the leucocytes, the protoplasm is stained lightly, the nuclei somewhat darker. In pyelitic abscesses, the leucocytes stain yellow and are imbedded in a stainless or lightly yellow stained mucous.

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*Origin and Prevention of Oxalic Sediment in the Urine.* Berliner klinische Wochenschrift, December 30, 1901.

Professor G. Klemperer suggests a diet which excludes milk, eggs, tea, cocoa, and most vegetables, and embraces meat, fats,

bread, flour foods, rice and leguminous vegetables, apples and pears. These contain considerable calcium and magnesium with a minimum of oxalic acid.

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*Note on Gauging Vesical Capacity.* By Dr. Frank Lydston, in *Journal American Medical Association*, February 8, 1902.

A small catheter and sterile water and normal salt solution is best for distending the bladder. A hypodermic injection of morphine, twenty or thirty minutes before gauging the bladder capacity, is very useful. Whenever the urine returns with some degree of force, but loses this force as the test proceeds, temporary distention atony has been produced and the test requires repetition.

*Virginia Medical Semi-Monthly*, Richmond, January 24, 1902, Sarcoma of the Testicle. By Lewis C. Barker.

*American Journal of Obstetrics*, New York, for January, 1902, Report of a Case of Primary Carcimona of the Urethra. By Abram Brothers.

*Chicago Medical Recorder*, January 15, 1902, Fatal Passage in Hypertrophy of the Prostate. Pelvic Abscess and Embolism of the Pulmonary Artery. By Maximilian Herzog.

Indications and Limitations of Massage of the Prostate Gland. By Louis E. Schmidt.

*Medical Bulletin*, January, 1902, Acute Gonorrhea. By John V. Shoemaker.

*Canadian Practitioner and Review*, Toronto, January, 1902, A New Method of Cutting Urinary Calculi; A Case of Unusually Large Calculus Removed by Suprapubic Section. By George A. Peters.

A third edition has appeared of an excellent work: *Diagnostik der Harnkrankheiten*. Von Prof. Dr. C. Posner in Berlin. Dritte Auflage. Berlin: August Hirschwald, 1902.

This third edition of Professor Posner's excellent work, presented as an introduction to the pathology of the urinary passages, comes eight years from the publication of the first.

In this interval important advances have been made in methods of diagnosis, and these are duly reflected in the present volume. There are fifty-four illustrations, and, as an appendix, there is presented a short symptomatology of the usual affections of the urinary organs.

The subject-matter is arranged in the form of ten lectures, and due attention has been paid to endoscopy, cystoscopy, and other advanced methods of exploration.

## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

### *Sweat Baths and Baths which Increase Bodily Temperature.*

R. Friedlaender of Wiesbaden, Germany, in an article published in the Philadelphia Medical Journal for August 31, 1901, discusses in a very interesting and instructive manner the difference between dry hot air and moist hot air treatments at a temperature of from 50° to 60° C. His conclusions as stated in the article are as follows:

First.—The body temperature was increased 1.5° C. by the steam bath as against 0.4° C. by the dry hot-air bath.

Second.—The pulse was increased sixty-three beats per minute by the moist as against thirty-eight beats per minute by the dry heat.

Third.—Frequency of respiration was not essentially changed by either form of treatment, but the depth of the breathing was increased, and this showed itself more prominently in the moist than in the dry heat.

Fourth.—The loss of weight in the moist heat (about one pound) was greater than in the dry heat, although the perspiration seemed to be subjectively greater in the latter form of treatment.

Fifth.—Palpitation of the heart, heat oppression, and congestion in the head were much more prominent in the moist than in the dry heat.

Sixth.—The perspiration was toxic; but was not demonstrated to have been more so in sick than in well persons, which renders untenable the attempted explanation of the beneficial effects of hot-air treatments in disease as being entirely due to the elimination of pathological toxines by the sweat.

Various poisons like mercury, arsenic, iodide of potassium, etc., are eliminated by the perspiration, and in connection with the treatment of renal diseases it is important to remember that albumin is also eliminated by this secretion. The intensity of the perspiratory process induced must act beneficially in removing transudates and exudates.

Seventh.—He considers the relaxing and analgesic influence upon the nervous system to be identical in both kinds of treatment.

Eighth.—After the dry hot-air treatments a noticeable increase in the number of leucocytes was observed, but after the moist-heat treatments they sometimes were increased as much as twenty-five per cent., and an increase sometimes persisted for twenty-four hours subsequent to the treatment, thus demonstrating that it was not a transitory phenomenon. This is

regarded as deserving of particular attention when the important rôle of the leucocytes in the battle of the organism with disease is taken into consideration. Individuals of vigorous constitution appeared to respond more profoundly in the matter of increased leucocytosis than weak anaemic subjects. The greater degree of leucocytosis induced by the moist hot-air treatment he believes to be due to the greater increase of the body temperature observed under this form of bath.

The induction of hyperthermia by hot baths is explained thus: When the temperature of the medium surrounding the body is raised above 34° or 35° C., "the organism tries to maintain its own temperature by increased heat elimination through the skin. This is in the first place made possible by the hyperæmia of the skin and the subcutaneous tissues, resulting from the vascular dilatation due to the irritation from the heat. The skin thus becomes warmer itself, and its heat conductivity, as well as that of the subcutaneous adipose tissue, becomes increased. Secondly, an increase in heat elimination occurs from the increased diaphoresis (which is soon set up in the bath by the heat irritation), and the continual evaporation of the sweat from the skin. Third, an increase in heat elimination takes place by reason of the increased amount of heat and evaporated water which escape during exhalation. If these processes, among which the evaporation of the sweat from the skin plays the most important rôle, are not able to establish the 'physical regulation' described by Matthes and others, an increase in temperature will take place to such an extent as to give rise to artificial fever, to hyperthermia. There does not exist any chemical means by which the increased conveyance of heat to the body can be regulated in the sense of a retardation and decrease of metabolism."

The greater degree of hyperthermia observed under moist-heat baths as compared with dry-heat baths of the same temperature is accounted for by the fact that when the evaporation of sweat, the most effective of the factors in maintaining the body temperature at the normal point, is impeded, as in the Russian steam bath, hyperthermia is easily induced, and varies according to the intensity and duration of the heat influence. In the dry-heat treatment the air surrounding the body is free from moisture, and evaporation of sweat is facilitated in the highest degree.

In discussing the modus operandi by which beneficial results accrue from heat baths he says: "Artificial rise in temperature is accompanied by an increase in metabolism, both in a quantitative and qualitative sense. The decomposition of albumin also rises above the normal. The investigations of Pfluger, Bartels, Naunyn, Schleich, Formanck, and Topp show that the production of urea is increased by hot baths. H. Winternitz not only observed as a result of hot-water baths

increased decomposition of substances free from nitrogen, an actual increase of oxygen consumption and carbon di-elimination to an extent never observed even in high

objects to the use of body temperature-increasing treat-  
ments in cardiac insufficiency, arterio-sclerosis, and anæmic or  
dystrophic individuals, and the article concludes as follows:  
"We prefer temperature-increasing baths:

1) In combating infectious and toxic conditions. In acute and subacute diseases due to exposure, catarrh of the respiratory passages, fresh rheumatic affections of the muscles and joints, and also in other infections, the onset of which is not characterized by high fever, and in which individual conditions render an increase of the fever permissible and desirable for the course of the pathological process. Furthermore in syphilis, and in a general gonorrhreal infection.

2) When an intense increase of metabolism is indicated from other causes, such as autointoxication, and in conditions affecting metabolism, like gout.

On the other hand, we favor sweat baths:

1) When a cure by means of free diaphoresis is contemplated; in exudations and transudations, in nephritis with albuminuria, in hydræmia and chlorosis, in metallic poisoning, and in obesity as an adjunct to other methods of treatment.

2) When chronic inflammatory processes are to be influenced by peripheral hyperæmia. In chronic and especially traumatic affections of the muscles, joints, and nerves, in the final conditions of acute articular rheumatism, in chronic articular rheumatism and arthritis deformans, in neuritides, and in tubercular arthritic affections."

Considering the foregoing from a therapeutical standpoint, we are forced to regret that Dr. Friedlaender confined his experiments with dry hot air to its use at a temperature of 100° C. and less. The value of his observations is vitiated by the fact that when the temperature of dry heat treatments is raised up to from 100° to 125° C., or twice the intensity used by him, some of its important relations with the moist heat treatments hereinbefore stated are directly reversed.

The essential point brought out by Dr. Friedlaender's work is that an artificial increase of the general body temperature is accompanied by, first, a marked increase in the consumption of oxygen and an intensification of the general metabolism of the body, hence an increase in the excretion of waste matter through the lungs, skin, and kidneys; and, second, a hyperleucocytosis that appears to vary in degree in direct proportion to the intensity of the hyperthermia. The raising of the body temperature is therefore the essential feature of the process by which a beneficial influence is secured, and we are of the opinion that it can be obtained more advantageously

by the use of the dry hot air body treatment than by the moist heat, for the following reasons, which may be compared numerically with the conclusions of Dr. Friedlaender noted at the beginning of this article.

First.—When the temperature of the dry hot air body treatment is pushed up to 100° or 120° C., instead of the 60° C. used by Dr. Friedlaender, the body temperature is raised from 1° to 2° C. in from thirty to forty minutes usually.

Second.—With an efficient degree of heat the dry hot air body treatment will increase the pulse from forty to seventy beats per minute during séances of thirty or forty minutes. This averages fifty-five beats per minute as against the sixty-three noted by Dr. Friedlaender in the moist heat baths. With reference to this point, however, we must remember that it is not only unimportant from a therapeutical standpoint that a great increase in the pulse-rate is induced, but that it is frequently very undesirable as indicating undue cardiac exertion. Another point in favor of the dry heat here is that even when the increase in the pulse-rate equals or exceeds that attributed to the moist heat, it does not exhibit usually an objectionable amount of the tension which leads Dr. Friedlaender to deplore the use of the body temperature-increasing treatments in arterio-sclerosis, etc.

Third.—Increased frequency as well as depth of respiration is an accompaniment of the dry hot air body treatments of efficient intensity, thereby securing a more effective excretion of those products of metabolic combustion that are thrown off by the lungs.

Fourth.—The loss of weight in an efficiently given dry hot air body treatment is usually more than one pound, and not infrequently as much as three, thereby demonstrating a much greater influence upon excretion than the moist heat exhibits, as reported by Dr. Friedlaender. This is of great importance in the treatment of conditions in which the elements of auto-intoxication and sepsis are prominent.

Fifth.—Palpitation of the heart, heat oppression, uncomfortable congestion in the head, and physical prostration following treatment are very rarely at all in evidence when dry heat is used, even at sufficiently high temperatures to produce a large increase in the body temperature; a point appreciable from the standpoint of the patient as well as the therapist.

His explanation of the manner in which the moist heat induces a greater increase of the body temperature than dry heat of the same intensity, viz.: by the impediment which the moisture-laden medium offers to sweat evaporation, thereby smothering the effort of the heat-regulating nerve-centers to maintain the normal thermic elevation, is clear and convincing, but affords another argument in favor of dry heat. By the use of the latter the evaporation of the sweat, hence the

excretion of the toxic matters that go with it, is facilitated in the highest possible degree. The withdrawal of this large quantity of fluid from the body requires that it be replaced at least to a large extent by the ingestion of water per orem, and in this way the effect upon transudates, exudates, and general metabolism is increased in proportion as the quantity of fluid withdrawn is large.

Another by no means unimportant point in favor of the dry hot air body treatment is that during its administration the head of the patient is never included in the bath, by reason of which the patient is not subjected to the unpleasant and unhealthy effects of breathing a heated air loaded with the exhalations of a stimulated body metabolism, and that even with the head exposed the requisite rise in body temperature can easily be induced. Dr. Friedlaender says that "the effect of the temperature-increasing baths is, to a certain extent, weakened when the head of the patient remains in cool air, as, for instance, in the case of the steam-chest bath."

Again, the existence of cardiac insufficiency, arterio-sclerosis, etc., does not furnish a contra-indication to the judicious and skillful administration of dry hot air body treatments, because the increase in the pulse-rate is not attended by an objectionable increase of tension. As a very large percentage of the victims of diseases in which the induction of artificial hyperthermia is beneficial are afflicted with cardiac and vascular pathologies, it is very desirable not to be obliged to bar them from the beneficent effects of the treatment.

Further, our experience with the effects of dry heat treatments has led us to believe that a large, if indeed not the greater, part of the benefit resulting from their use is secured through reflex stimulation of the spinal and sympathetic nerve centers produced by thermic irritation of the multitudes of nerve endings in the skin, rather than by the mere raising of the body temperature or the transudation of the body fluids resulting from the excretion of sweat and its replacement by fluids per orem. There are very few pathological fevers that do not raise the body temperature as much and more than do heat treatments, but the same beneficial results are by no means as observable, even when pathology for the removal of which heat treatments are appropriate is present at the time. In septic infection, for instance, the pathological fever frequently rises much higher than that following a heat treatment, but the patient grows sicker nevertheless. A body hot air treatment, however, will be followed by a decrease in the pathological fever, and the patient at once begins to improve.

Finally, we regard artificial hyperthermia as symptomatic only, dependent upon, synchronous with, and indicative by its degree of the extent of a reflex stimulation of nerve centers governing trophic and metabolic processes, set up by thermic

irritation of the nerve endings in the skin. It appears to be intense in proportion as the thermic irritation is profound, and as this is greater in the dry hot air treatments, because of the higher temperatures which it is possible to use, this method is to be preferred to moist hot air for inducing it under nearly all, if not all, circumstances.

"There are many cases of flat feet which still continue to be painful, even after all the measures referred to (Mechanical support and gymnastics.—Ed.) have been faithfully carried out, and these are the cases which demand something in addition to the routine treatment. A foot that has borne weight all day is hot, tender, and painful, and all motion is limited. A few minutes of massage is extremely soothing to such a foot. The pain is relieved, the foot is rendered much more flexible, and the gymnastic work can then be done with comfort. If heat is applied just before the massage, the result is even better, and heat alone, without massage, is of the greatest value just preceding the gymnastic exercises. In hospital cases I have used the hot air oven in almost every painful case with much benefit. It has also been of great value in cases of contracted Achilles tendons, where gradual stretching was done, the tendon yielding much more and much easier after an hour in the hot oven."—Frank E. Peckham, M. D., in Philadelphia Medical Journal for August 10, 1901.

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## DIETETICS.

*The Food Factor as a Cause of Health and Disease During Childhood, or the Adaptation of Food to the Necessities of the Growing Organism.* By Joseph E. Winters, M. D., N. Y., in the Medical Record for January 25, 1902.

The article begins with the consideration of the substitution of food for milk in the diet of an infant. When baby comes he has a supply of iron in the liver which he can draw upon for the blood coloring matter until his digestive organs are fitted to digest food other than milk. So nature wisely provides that milk shall have but a small quantity of iron—from seven to fourteen times less than the other articles of food.

Anæmia is the first pathological condition noted when the child's diet is not modified at the proper time. As Dr. Winters states, "the chemistry of milk, the physiological chemistry of the child, and the physiology of the digestive organs denote that such change should be made at a fairly definite time." From the seventh to the tenth month the presence of the diastasic ferments tells us that farinaceous food should follow milk. The chemical composition of oatmeal shows that it has the greatest value—proteid, 14½ per cent.; fat, 10 per cent.; mineral matter, 2 per cent.; starch, 30 per cent. It is one of

the richest in iron of the vegetable foods; 94 per cent. of the nitrogenous matter, being proteid in form, can be used for tissue building. Oatmeal should be strained to free it from the woody fiber. "A tablespoonful of oatmeal jelly may be added to every second bottle at first, then every bottle, and later the amount may be gradually increased to two ounces in every bottle." Barley gruel may be required instead of oatmeal, but by comparison it is poor in fat, proteid, and iron. Do not begin to use farinaceous food during the warm months. Milk and cereal gruels should be its diet for the first year. "Soft-boiled or poached egg, mixed with bread crumbs from stale bread, may be added to the diet at the beginning of the second year. Its value is due to 14.8 per cent. of proteid and 10.5 per cent. of fat. A small part of an egg should at first be given twice a week. Gradually increase the amount until the whole egg is given at a feeding. An egg may be given twice or thrice a week later." The child may have "a dry crust of stale bread twice a day." It develops the organs of mastication, and is easily digested. Baby may have a piece of stale bread in milk. "At the end of fifteen months, a child (when normally developed) is getting whole milk, oatmeal or barley, a soft-boiled or poached egg twice or sometimes three times a week, a dry crust of stale bread twice a day, and perhaps a little bread and milk." Use no sugar, as its affinity for water retards digestion. Fruit, orange juice, and prune pulp may now be given. Bulk is an important factor in the diet of a child, as it assists in the complete development of functional activity and of the muscular walls of the intestine, therefore give carbohydrates and vegetable food largely during growth and development. "For the perfect development of the growing structure in a child, proteids, mineral elements, fats, and carbohydrates are required in relatively larger proportions than in an adult."

Dr. Winters then considers seriatim (1) Nitrogenous matter; (2) the fats; (3) the carbohydrates; (4) mineral elements; (5) water.

The following conclusions are drawn:

Nature, or to be specific, chemistry, physiology, and chemical physiology, has furnished unerring guides for the feeding of children.

The time when and what farinaceous substances should be given is wholly evident.

Meat juice is contra-indicated in very young children, owing to its exciting effect on the nervous centers, and the loading of the system with extractives which tax the excretory organs.

During all the years of early childhood, meat and its preparations should be given only sparingly on account of their over-stimulating metabolism, but chiefly for the reason that they create a distaste for cereals, fats, and fresh vegetables, thus depriving the system of materials needed to shield the pro-

teids from oxidation, that they may be stored for future needs, and of the necessary mineral salts which vegetables obtain direct from the soil.

In a child, with its relatively large cutaneous surface and correspondingly rapid heat loss, the large demand for calorics must not be covered by proteid to any considerable extent, otherwise there is a lack of deposition of proteid, or of muscle growth. Increasing quantities of carbohydrates and fats in the food decrease proteid metabolism; a more lasting deposition of proteids for future needs is thus brought about.

"To provide the mineral constituents necessary to maintain the normal reaction of the fluids of the body when these elements are being appropriated in larger proportions for the growth of bone, muscle, etc., vegetables which obtain these elements direct from the soil must be consumed in fairly liberal proportions."

A.-S.

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## CLIMATOLOGY.

*The Climate of Arizona in the Treatment of Pulmonary Tuberculosis.* By J. M. Swetnam, M. D., of Phoenix, Ariz. (in American Medicine, November 1).

Pulmonary tuberculosis is a germ disease, and in selecting a climate, a section of country should be chosen that possesses the conditions which will most certainly and successfully aid the recuperative powers of the patient in destroying germs. These conditions are: (1) The greatest possible amount of sunshine; (2) a mild climate; (3) a porous soil; (4) a pure dry atmosphere, and (5) light winds. There are many localities in Colorado, New Mexico, Texas, and California that possess most of these conditions, but the Salt River Valley, Arizona, and the surrounding country, possesses all of them. The elevation is from 1000 to 4000 feet above sea-level. There is no fog and little wind. During the whole winter the temperature rarely reaches the freezing point and snow and blizzards are unknown.

The highest relative morning humidity is in February, 77°, and the lowest relative morning humidity is in September and May, 41°. The highest relative afternoon humidity is in February, 42°, and the lowest relative afternoon humidity is in April, only 15°. The rainfall for the nine months was only 4.39 inches. The lowest temperature was in December, 22° F. while the percentage of sunshine, in a possible one hundred per cent., is very high, reaching ninety-two per cent. in December, the lowest being sixty-three per cent. in January. The climate in the Salt River Valley is so mild and the temperature so equable that the patient can spend nearly all of the time out of doors, filling his lungs with the pure, dry air, so beneficial to

him in his struggle for life and health. Indeed, the percentage of sunshine in the Salt River Valley is greater than in any other locality in the world.

The soil is principally of a sandy formation and, after a heavy rain, is dry in a few hours. There are many stories told of the heat in Arizona. The mercury does climb high in Arizona in the summer, and sometimes in October and May; but there is a peculiar dryness about the atmosphere that takes away the oppressiveness of the heat. The absorption of the moisture from the skin into this dry atmosphere keeps the body relatively cool. Such a thing as death from heat prostration is unknown here. People follow their outdoor avocations without fear and with little discomfort with the thermometer at 110° F. in the shade and 130 F. in the sun. Many patients suffering with pulmonary tuberculosis improve rapidly while the heat is most extreme. Pulmonary tuberculosis is almost unknown in a native Arizonian, and as the Salt River Valley is a great natural sanitorium, it should be better known and utilized.

While asthmatics and those suffering from bronchitis do well here, they often do better at a higher elevation. For these there is Prescott, at an elevation of 5000 feet; Flagstaff 6900 feet, and Nogales 4000 feet. Arizona has the sunshine, the mild climate, the dry, warm atmosphere, the light winds, the porous soil and choice of elevation, combining as many of the conditions necessary to the successful treatment of pulmonary tuberculosis as any other known locality.

Last, but not least important, is the diversity of employment and pleasure which is offered to seekers for health. The cities are model communities, made up largely of Eastern people, and with amusement, religious and educational facilities which are unsurpassed anywhere in the United States.

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## ORTHOPEDICS.

*Proper Foot-Wear and the Treatment of Weakened and Flat Feet by Mechanical Devices for Maintaining the Adducted Position.* By John A. Sampson, M. D., of Baltimore, Md.

The paper (Am. Medicine; January 18, and Johns Hopkins Bulletin) is graphically illustrated, and treats the subject in a forceful manner. The character of footwear which induce deformities is clearly shown.

To summarize, we may say in favor of a heel :

1. If placed forward on the shoe the working angle of the arch is diminished, thus there is less strain on the ligaments maintaining the arch.

2. The body weight being thrown forward, walking is a little easier, less muscular effort being required.

3. It helps to prevent slipping. This is noticeable especially in walking down hill.

4. By elevating the posterior limb, the actual working lever of the foot becomes a little longer.

5. We are accustomed to heels, they are fashionable and make the wearer appear taller.

Against a heel may be said :

1. It creates a deformity which acts not only as such, but also changes the arches so that there is a redistribution of work to be done, and work falls on parts ill adapted to perform it.

2. There is an increase in the amount of strain on the anterior portion of the foot, which is not as well adapted to receiving it as the posterior.

3. The function of the transverse arch is interfered with or lost by the toes being maintained in dorsal flexion.

4. Heels are usually unstable, the instability increasing with the height, smallness of their diameter, and forward position on the shoe.

5. The front of the foot is forced into the toe of the shoe.

6. The strain on the ligaments maintaining the arch is increased unless the heel is placed forward—the further forward the heel the less the strain, but with greater injury to the rest of the foot. Should the heel be placed so far forward that it would be directly in line with the transmission of the body weight to the ground, there would be very little strain on the ligaments, and it would be as though we were walking on stilts, in other words, as though our foot had been replaced by a wooden stump.

The shoe for a normal foot or one nearly so, which can voluntarily assume the positions of strength, should have the following features :

1. Most important of all is that the angle of lateral deflection of the shoe be the same as that of the foot in its adducted position.

2. A straight inner edge or, if hallux valgus exists, an inner edge a little straighter than the inner edge of the foot, thereby better supporting the long arch, and preventing pronation.

3. The front of the shoe of the same depth along the inner edge as the thickness of the foot at that place, thus permitting the thickest portion of the front of the foot, the big toe and inner side, to assume their proper positions.

4. The shoe convex, not concave, along the outer border of the shank at the mediotarsal articulation. If convex we have pressure at this point, interfering with adduction.

5. The forward part of the shoe should be as wide as the weight-bearing portion of the foot at that point and room for the individual toes to rest on the sole.

6. The posterior portion of the shoe should grasp the heel

of the foot firmly and be well supported. The stiffening should not extend beyond the mediotarsal joint.

7. There should be no spring, *i. e.*, dorsal flexion of the front of the shoe, which interferes with walking and lessens or destroys the transverse arch.

8. The distance from points in the shoe corresponding to the heel and distal end of the first metatarsal bone must be the same as in the foot. If the distance in the shoe is longer abduction is interfered with, as shown in Fig. 7.

9. The shank of the sole should be convex along the outer border, thus better supporting the outer arch of the foot ; it should also be higher on the inner edge, and not so wide but that the upper of the shoe can snugly fit the instep.

10. The sole of the front of the shoe should be flat from side to side.

11. The lower and broader the heel the better.

12. A steel spring in the shank of the shoe helps maintain the shape of the shoe and that of the foot.

13. A little "Scotch," or lateral extension of the sole, makes our base of support wider, renders the parallel gait easier, and if broader along the inner side than the outer it hinders pronation.

14. The bottom of the last, or the inner sole pattern, must include the area covered by the weight-bearing portion of the foot.

There can be purchased many so-called reform shoes, but usually there are one or more features preventing the foot from assuming the adducted position in the shoe.

The weakened foot, known as the adducted or pronated foot, is associated with the two movements together, viz., adduction and rolling over inward, or pronation. The internal malleolus is prominent, and the ability to adduct the foot lessened or lost. The writer proposes the following measures for correction :

For nearly one year he has been wearing a device for holding the foot in the adducted position, which, with the aid of proper footgear, has relieved him from all previous disagreeable symptoms. The device may be called a toe-post. It is represented in Fig. 3. It is maintained in its proper position in the shoe by means of an inner sole with a slit between the positions of the large and second toe, through which the upright of the toe-post projects (see Fig. 5). To make a toe-post :

First cut an inner sole of cardboard 1.5 to 2 mm. thick, having the outlines of the sole of the last, for it must exactly fit the inside of the shoe. Place the foot on this inner sole held in the adducted position, the big toe held along the inner edge, and with a pencil mark a line between the big and second toe. Remove a small slip of cardboard 2cm. long and 3mm. wide along this line, leaving a slit in the inner sole. The posterior end

of the slit should be about 1.5 cm. anterior to the front of the foot between the two toes. To make a pattern for the toe-post follow the directions in Figs. 1 and 2. With heavy shears

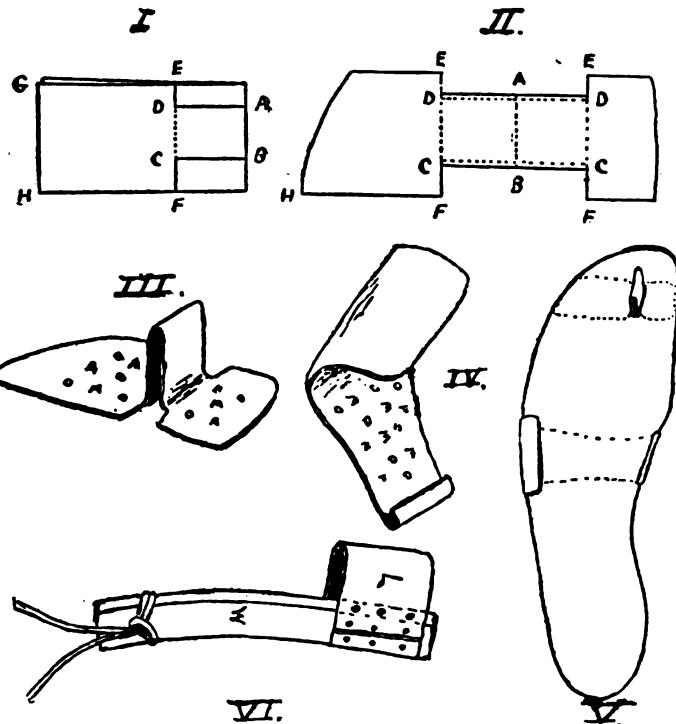


Fig. 1. Making the pattern for a toe-post. A heavy piece of paper folded once along the line A B. A D E and B C F are cut away, leaving the tongue A D C B. A D should equal the depth of the shoe at that point, and A B should be as wide as the length of the slit in the cardboard inner sole. The tongue is inserted in the slit, and the bases folded back and cut away to conform to the front of the inner sole. When removed and straightened out, this forms the pattern in Fig. II.

Fig. 2. Pattern of paper from which the tin is cut. The edges D D and C C are to be turned in. Tin is folded along the dotted lines A B—D C and D C forming the toe-post in Fig. III.

Fig. 3. Shows the toe-post ready to be inserted into the cardboard inner sole. Rough points on the upper and under surfaces of the base, which are made by punching holes with an awl, hold the toe-post to both the inner sole of the shoe and the cardboard inner sole.

Fig. 4. Shows foot adductor made of heavy tin and fitted over the last at a place corresponding to the middle two-thirds of the fifth metatarsal bone. This slips over the cardboard inner sole, as shown in Fig. V. It also has rough points to prevent displacement, as in the toe-post.

Fig. 5. Cardboard inner sole, with toe-post and foot adductor attached.

Fig. 6. Foot and big-toe adductor to be worn at night. It consists of a curved piece of wood, W, with a leather loop, L, which fits over the big toe. When the thongs are tied as represented in Fig. VII the foot and the big toe are adducted.

cut out from tin according to the pattern, using No. IC or IX tin. The tin is to be folded as indicated in Fig. 2. The folding should be rounded, not angular, thus imparting elasticity to the toe-post. Slip the upright portion of the toe-post through the slit in the cardboard inner sole and trim the edges of the bases, if necessary, so that they will not project beyond the edge of the cardboard inner sole. Place it in the shoe and try it. If any adjusting is necessary, change the position of the slit in the inner sole as needed. Make sure that the post does not strike the front of the foot. I prefer a cardboard to a leather inner sole because the cardboard, by absorbing moisture, keeps the feet dry. New inner soles should be used every week. After having determined the proper position for the slit, keep an inner sole as a model from which to make others. The patterns for one foot reversed serve as patterns for the other. It is not any more trouble to change the cardboard inner soles than to change one's stockings, and the hygienic reasons for both are the same.

He had worn the toe-post for a year under all conditions, as tramping, tennis, golf, in the operating room, etc. He had worn it in one shoe one day and in the other shoe the next, and at the end of the day the foot supported by the toe-post would feel strong, while the other would be tired. The toe-post maintains the foot in the adducted position, prevents hallux valgus, and does not cause discomfort when properly adjusted. There is a greater sense of security, for the shoe seems to be a part of the foot and the foot grasps the shoe in walking. The Greeks wore sandals with a leather thong between the first and second toe, holding the sandal in position. Judging from their statues they did not suffer from pronated feet, and we have never heard of their shoes hurting them. The principle is the same in the toe-post.

In favor of a toe-post such as I describe I think it may be said :

1. That the weakened foot which can be passively adducted—with the toe-post and the aid of a proper shoe—can be relieved from its previous symptoms, for it holds the foot in the adducted position, thus naturally supporting the long arch, prevents the rolling over inward, and overcomes hallux valgus.

2. That it is not only comfortable, but gives one a greater sense of security and strength.

3. It is simple, easily made, fitting in a slit in an inner sole. Any adjustment necessary can be made readily, which would be impossible if it were incorporated in the structure of the shoe.

Another means of holding the foot in the adducted position is represented in Fig. 4. It helps out the toe-post and is comfortable. It can be made from XX tin. Fig. 5 shows a cardboard inner sole with toe-post and foot adductor in position.

It is obvious, if we wish more than temporary relief, that our feet must be treated by night as well as by day. For two years I have worn at night a big toe and foot adductor. This device is not uncomfortable, it overcomes hallux valgus, maintains the foot in the adducted position, thus relieving ligaments which have been stretched during the day. There are other means of treating the pronated foot, as massage, forcible adduction of the foot, and gymnastics. These are all important adjuncts to whatever mechanical means we may employ. In extreme cases a flat-foot brace, if it can be worn, is of great service, for when we elevate the arch we adduct the foot and pronation is interfered with. One thing more about the treatment of the weakened foot. Do not simply relieve symptoms, but let the treatment be progressive and when new shoes are necessary see if the foot will not stand a little more adduction, and alter your lasts as necessary. At present I am able to wear a shoe which would have been impossible a year ago. In altering a last to increase the adducted position cut away the last at places 1, 2, 3 of Fig. 1; thus we increase the adducting forces. This causes the shoe to make pressure at the mediatarsal joint on the inner side of the foot and counter-pressure at the heel below the mediatarsal joint, and over the fifth metatarsal bone on the outer side. The foot will now become more adducted, if there is room. This is furnished by adding leather to the last at places 1, 2, 3, Fig. 2. This diminishes the abducting forces and permits the foot to assume the adducted position.

**Flat Foot.**—Two of the most noticeable features of the flattened foot are the lowering of the arch and abduction. We have considered the effect of the abducted position. Now let us consider what effect the lowering of the arch has upon the structure and mechanism of the foot. The transition from a normal and weakened foot to a flattened foot is so gradual that it is hard to say just where to draw the line. The most important factor in the treatment of flat foot is that of prophylaxis. One cannot begin too early, for it is much easier to correct an arch whose ligaments have been under a strain of a few hundred pounds than one which has been under a strain of several thousand pounds. We may classify flat feet into the mobile, those which can be passively adducted and the arch increased, and the rigid form. Do not treat the rigid flat foot with a brace until the deformity has been passively corrected, for the surgeon who fits a brace to a rigid flat foot is in the same position as the gynecologist who treats an adherent retroflexed uterus with a pessary. In both cases the mechanical supports will injure soft parts and not do any good. Two features in flat foot must be corrected; first, the lowering of the arch, and second, the abduction of the foot. When we correct one we aid the other, but when we treat both our results

will be fourfold. Begin with proper shoes which maintain the foot in the abducted position, as for the pronated feet. How often the surgeon has his patient wear a flat-foot brace, a brace which elevates the arch and thereby tends to adduct the foot, in a shoe in which adduction is interfered with or impossible. In these the additional support afforded to the arch by adduction of the foot is lost and the elevation of the arch is interfered with, because its associated movement adduction is impossible. After obtaining proper shoes, have a brace made is shown in Figs. 8, 9, 11, and 12. This brace supports the

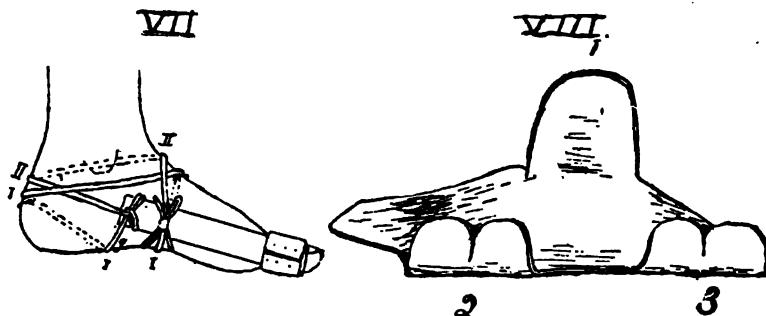


Fig. 7. Foot and big-toe adductor as applied to the foot.

Fig. 8. Plate for flat foot, made from No. 20 sheet steel. It supports the arch, thereby adducting the foot, and by holding the foot in the adducted position by forces 1, 2, and 3, the arch is maintained. The view is from the outer side. 1 is the flange on the inner side fitting over the astragalo-scaphoid articulation. 2 represents the anterior flange fitting over the middle two-thirds of the fifth metatarsal bone. 3 is the posterior flange fitting over the os calcis posterior to the mediotarsal joint.

arch but maintain the foot in the adducted position. A brace for flat feet which I have worn and found very comfortable is shown in Figs. 8, 9, 11 and 12. This brace supports the arch, thereby also adducting the foot and vice versa ; the arch also supports the adducted position. If one wishes to hold a foot in the adducted position it can be done most readily by grasping the foot with two hands, the thumbs being close together, and making pressure against the astragalo-scaphoid articulation. The fingers of one hand grasp the front of the foot over the fifth metatarsal bone and the fingers of the other hand grasp the heel. These forces we may resolve into the adducting forces 1, 2 and 3 as represented in Fig. 9, etc. This brace employs the same forces : flange 1 makes pressure over the astragalo-scaphoid articulation and prevents the rolling over inward of the weakened foot. As the long arch is elevated more of the body weight falls to the outer side of the foot. The body weight and the inner flange 1 are resisted by the two outer flanges, 2 fitting over the middle two-third of the fifth

metatarsal bone and 3 over the heel posterior to the mediotarsal articulation; thus the foot is held in the adducted position. It would seem that any brace which has a flange fitting over the calcaneo-cuboid articulation on the outer side of the foot must abduct the foot, thus interfering with the elevation of the arch. When the long inner arch is elevated and more

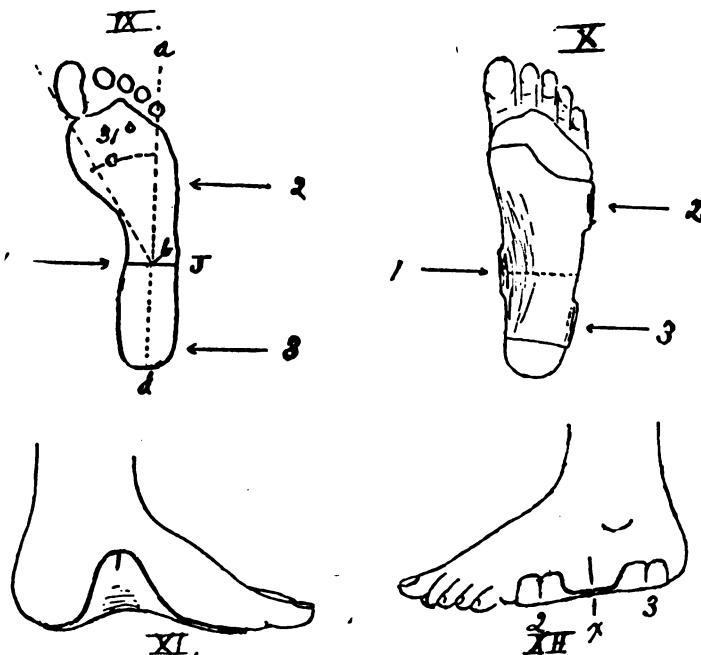


Fig. 9. Foot in adducted position.  $31^{\circ}$  angle of lateral deflection. J, mediotarsal joint. 1, 2, and 3 are the forces one would use to maintain the foot in this position.

Fig. 10. Flat-foot brace applied to the foot. The foot is held in the adducted position by the flanges as indicated, which act as the adducting forces 1, 2, and 3.

Fig. 11. Inner view of flat-foot brace. Innet flange, 1, fits over the astragalo-scaphoid articulation, thus preventing the rolling over inwards of the foot, and with the two outer flanges it holds the foot in the adducted position.

Fig. 12. Outer view of flat-foot brace, showing the fangs 2 and 3 which, with 1, hold the foot in the adducted position. There is no pressure over the calcaneo-cuboid joint at x which would cause abduction.

weight is thrown to the outer arch of the foot, this weight will be opposed by this flange, which will act as the abducting force 1, and the body weight as abducting force 2 and 3. These are the same forces one would use to straighten a bent stick. We would grasp the stick with both hands and the opposing force, as our knee, would be placed against the angle

in the stick. Thus such a brace must straighten, *i. e.*, abduct the foot and thereby interfere with its own action. It is essential that a brace such as I have described shall fit the foot accurately, otherwise it will be very uncomfortable or else not do any good.

To Make a Flat-foot Brace.—First make plaster casts of the feet in the adducted position. To do this have the patient sit in a chair with the leg of the foot from which the cast is to be taken resting on the knee of the other leg. Having poured enough plaster on a piece of paper on another chair near enough for the foot to rest on, let the foot sink into the plaster with the outer side of the foot down and the long axis of the foot horizontal. As it sinks adduct the foot by lifting up the big toe, and hold it adducted until the plaster has hardened. Rub some vaseline over the edges of the plaster and a little over the foot, and cover the rest of the foot with plaster. When the plaster has hardened separate the two halves, re-vaseline and tie together, and this will form the mold for the cast. After making the cast, mark the mediotarsal joint and the tuberosity of the fifth metatarsal bone. Outline the brace as shown in Figs. 8, 10, 11 and 12. The casts may need a little trimming, the arch may be increased a little. From these casts the braces are made according to the outline, using No. 20 or 22 sheet steel. These braces assume their proper positions in the proper shoe and do what is claimed for them. A toe-post also helps out the flat-foot brace by overcoming the hallux valgus and helps in maintaining the adducted position.

If I have written anything of practical value in this article, special thanks are due to my own feet, which without grumbling have stood all kinds of experiments, and have constantly been urging me during the last three years that something must be done for bettering the foot and its covering, both in its normal and weakened conditions.

[When cases of flat-foot come under the observation of the specialist the structures about the joint are invariably in a swollen and painful condition—the site of inflammatory action induced by the strain upon the parts in unnatural relations. In very many cases the patient has been for months, often for years, upon anti-rheumatic treatment. So many cases have been referred to the writer in this condition that it is deemed worthy of comment. Special attention as well is called to the value of the electro-static treatment for the purpose of relieving these inflammatory conditions. It is surprising how soon these are brought under control, even in cases of long standing, and thereby afford a most valuable adjunct to the necessary mechanical treatment.

The joints covered with tin, except over the tendo Achilles, and the wave current administered for at least twenty minutes with a spark-gap, as long as is possible without causing pain or muscular traction, followed by long sparks over the articular interstices, avoiding bony prominences. The brush discharge is also of value in these cases.—[Ed.]

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### SOCIETY MEETING.

#### THE FIRST REGULAR MEETING OF THE CLINICAL SOCIETY OF THE NEW YORK SCHOOL OF PHYSICAL THERAPEUTICS

Was held at the rooms of the school, 627 Lexington Avenue, on Friday evening, February 28, 1902, Dr. Robert Newman in the chair.

Clarence E. Skinner, M. D., LL. D., of New Haven, Conn., addressed the meeting upon the "Treatment of Malignant disease with the X-ray," presenting his remarkable case, reported by Dr. Kirby in the JOURNAL for February. He reported also the results in progress in the treatment of eight abdominal cases now under treatment at his sanitarium. The results obtained are most encouraging, and the credit is due to Dr. Skinner of first reporting progress in the treatment of a group of abdominal cases with the X-rays. The results obtained are the most remarkable to date. The doctor advises the employment of high-vacuum tubes and uses a twelve-plate Wimshurst-Holtz static machine as the exciter. Dr. William Benham Snow also presented a case of osteo-sarcoma of the face which is showing remarkable improvement under treatment with the high-vacuum tubes, and a case of epithelioma of the larynx, also improving.

The meeting closed with a demonstration of the method.

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### NOTES AND COMMENTS.

The British Electro-Therapeutic Society was constituted at a meeting held on January 10th at 11 Chandos Street, London, W., with the following officers: President: Dr. W. S. Hedley. Vice-Presidents: Drs. Lewis Jones and H. B. Turney. Council: Drs. Barry Blacker, Wilfrid Harris, George Herschell, Septi-

mus Sunderland, Hugh Walsham, William Armstrong, J. Allan, James Barr, Hall Edwards, Robert Jones, and Ernest Solly, with power to add to their number. Honorary Treasurer: Dr. H. M. McClure. Honorary London Treasurer: Chisholm Williams, F. R. C. S. E. The annual subscription is one guinea, and there will be eight meetings in the year. A journal will be published quarterly. Medical men desirous of joining are asked to send their names to the Honorary Secretary, 20 Bedford Square, W. C.

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The following letter was received by the President of the American Electro-Therapeutic Association:

MADRID, January 3, 1902.

Mr. President: On the occasion of the Fourteenth International Medical Congress, which will take place, as you know, at Madrid from the 23d to the 30th of April, 1903, the Executive Committee, and with it the Spanish Medical Corps, will do themselves the honor of inviting a large body of men of science of all countries, hoping that they will, by their presence, make this great scientific meeting more brilliant.

We shall be greatly honored and very happy if the eminent Society over which you preside will take part in our work and send a delegate to represent you. We would be greatly obliged if you would let us know your decision in the matter as soon as possible.

Please accept, Mr. President, the assurance of our highest consideration.

Secretary General,

A. Fz. CARO.

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## BOOK REVIEWS.

A very timely treatise on smallpox to sell at \$3 is announced for publication early in April by J. B. Lippincott Company. It is written by Dr. George Henry Fox, Professor of Dermatology in the College of Physicians and Surgeons, New York City, with the collaboration of Drs. S. Dana Hubbard, Sigmund Pulitzer, and John H. Huddleston, all of whom are officials of the Health Department of New York City and have had unusual opportunities for the study and treatment of this disease during the present epidemic.

The work is to be in atlas form, similar to Fox's Photographic Atlas of Skin diseases published by the same house. A strong feature of the work will be its illustrations, reproduced

from recent photographs, the major portion of which will be so colored as to give a very faithful representation of typical cases of variola in the successive stages of the disease, also unusual phases of variola, vaccinia, varicella, and diseases with which smallpox is liable to be confounded. These illustrations number thirty-seven and will be grouped into ten colored plates  $9\frac{1}{2} \times 10\frac{1}{4}$  inches, and six black and white photographic plates.

The names of Dr. Fox and his associates assure the excellence of the work, in which will be described the symptoms, course of the disease, characteristic points of diagnosis, and most approved methods of treatment.

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## NEW AND IMPROVED APPARATUS.

This department is devoted to publishing, with illustrations, drawings, and descriptions, new apparatus, electrodes, etc., for the benefit of those interested in the progressive improvements in armamentaria.

### *A New Cystoscope for the Simultaneous Catheterization of both Ureters, and for Double-Current Irrigation of the Bladder.*

This is an instrument designed to facilitate the catheterization of both ureters during the one sitting, and to leave them à demense (Frederic Bierhoff, M. D., New York City). It is a modification of the Hitze-Albaran single ureter-catheter cystoscope. The modification consists in the use of two separate tubes to convey the ureter-catheters, and two knee mechanisms, controlled by the same screw, to alter the curvature of the catheter, the whole being in one movable sheath which surrounds the shaft of the cystoscope. (See Fig. 1.) The method of use is as follows: A black ureter-catheter is inserted into the canule on the operator's left hand, a brown one into the right. The instrument is then inserted as is the old cystoscope, and one or other ureter sought for and catheterized (the catheter being inserted about four to five cm. into the ureter). The knees are then turned down again and the other ureter located. During this latter procedure the first catheter moves out of the field of vision and may be entirely disregarded by the operator. The second ureter is now catheterized, the knees again turned down, and the instrument turned so that the operator may assure himself, before withdrawing it, that both catheters are inside. (See Fig. 2.) The lamp is then extinguished and allowed to cool, and the cystoscope turned upward within the catheterizing portion, so that the beak points toward the middle line of the abdomen. (See Fig. 3.) The catheterizing portion meanwhile being held, and continuing to point downward. The instrument is then slowly

withdrawn, its removal being compensated for by a gradual insertion of move of the catheters into the canulæ. When the knees of the instrument and the catheters appear at the meatus, the catheters are held at the urethral orifice with one hand, and



FIG. 1.



FIG. 2.



FIG. 3.

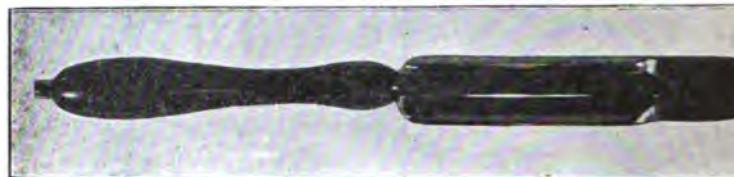
the cystoscope steadily withdrawn with the other. In the course of the operation the black catheter will enter the left ureter, the brown one the right. It will then be an easy matter to collect the separate urines and distinguish that flowing from each kidney.

Should the fluid become turbid during the operation, the catheters and screw-caps upon the canulæ may be removed,

the stop-cocks and rubber tubes inserted into the canulae, a double-current irrigation be employed before again refilling the bladder, the instrument remaining inside.

The instrument retains the size of the old, single instrument of Bitze-Albaran (average, 23 charriere).

*A new rectal electrode* designed for the treatment of pros-



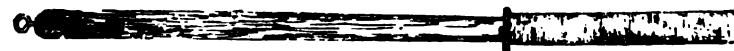
titis, to be used with the static wave current.

*A new uterine electrode* provided with adjustable stems of different sizes for treatment of spasmodic dysmenorrhea, a



without the stems for making applications of the static wave current to the cervix.

*An electrode* to be made of various shapes for administering the brush discharge from a static machine or other high potential exciter. It consists of a wooden terminal covered with glass and provided with a long handle of the same quality.



wood (soft maple or some wood of like texture), which afford a means of varying the resistance by moving the attachment of the grounding chain towards or from the place at which discharges are administered. These electrodes effect the same results as is obtained from the vacuum electrodes which it is proposed to be patented, and are not patentable in any form. [EDITOR.]

# *The Journal of* **Advanced Therapeutics**

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No. 5.

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MORTON'S WAVE CURRENT OF THE STATIC MACHINE AND WERBER'S INSULATED TERMINAL.\*

BY ROBERT NEWMAN, M. D., NEW YORK.

When Dr. Morton demonstrated the application of the wave current with the static machine, and showed the usefulness of his new application in a paper read before the New York Harvard Medical Society, November, 1899, the author was present and favorably impressed by the good results claimed for the wave current. This current, which Dr. Morton calls the "electrostatic" current, is the static charge modified by the simultaneous use of the sliding poles making a spark-gap. This current is commonly applied by connecting one of the poles with the platform and grounding the others, and at the same time the discharge rods are brought into action, and the compression of the working current increased or diminished by the length of the spark-gap between them. The working current is leaked off from the prime conductor and is applied directly to the skin by an electrode held in firm opposition, and the remainder of the current is discharged across the spark-gap; each spark causing an interruption or wave which causes the working current to manifest itself in oscillations, similar in feeling to the make and break of the faradic current, and the effect is more or less localized in that the action is exerted more vigorously in the immediate area to which the electrode is applied to the skin.

His method of application and the physiological results produced have been minutely described by Dr. Morton in his paper published in the Medical Record, December 9, 1899. Our member, Dr. Snow, has given descriptions of modifications of the wave current in his articles in the Journal of Electro-Therapeutics for June, 1901, etc. In his descriptions

\* Read before the Association, September 25, 1901.

he gives more minute details and several different modifications. He increases the number of electrodes in different ways, direct or indirect, and he also uses a Leyden jar which has no direct connection with the prime conductor of the machine. And this writer wishes to call the attention of the Association to a further modification of the wave current which was called to my attention by Dr. Gustavus Werber of Washington, D. C., more than a year ago.

I was early impressed with the efficacy of the wave current and have since used it almost daily, and I have found that it will cure in many instances and produce beneficial results in otherwise incurable diseases. Among the ailments treated successfully were tumors, sexual impotence, neuritis, rheumatoid arthritis, etc. Locomotor ataxia I have found can be arrested and thereby practically cured, if the patient is treated during the first or second stages of the disease. If, however, the degeneration of the cord has been far advanced, no one should have the credulity to expect a cure; for if any vital organ has been so far destroyed that its function cannot be performed the life of that patient is at an end, no matter whether it is the spinal cord, the lungs, the liver, kidneys, or any other vital organ.

The success of the wave current, as in many other electrical applications, depends on the skilled technique of the specialist and failures and resulting condemnation of electro-therapeutics must be continued to be expected from the tyro who, having read of articles giving good results, attempts to duplicate them by the use of a remedy of which he has learned nothing of the fundamental laws and principles of its application and much less of skill in its technique. Failure in any other department of medicine must be expected under like conditions. It is of almost daily occurrence that the writer gets a letter from some physician who expresses enthusiasm for the use of electricity, and reports trials and failures. The cause of the failures is usually very plain, as the letters frequently manifest dense ignorance of the subject. Some even wish to treat themselves, which is certainly more commendable than to offer unskilled professional services to unwary patients.

In the many different applications of static electricity the whole body of the patient is as a rule pervaded by the current. In the wave current the effects are in a measure localized

immediate vicinity to which the electrode is applied. But at the same time general effects are produced by the diffusion of the current throughout the body, and the same phenomena noted by the compression of the current are noted in this application and the resulting benefits of compression are obtained. Reasoning from analogy that a further compression of the current would give an increased leverage, so to speak, influencing the tissues, Dr. Werber has devised an insulated terminal for one of the sliding poles of the machine, which is accomplished by merely interposing a section of vulcanite in the discharge-rod to which it is attached. By making this insulation sufficiently long to prevent sparking across, under circumstances the power of compression of the current is limited only by the capacity of the machine.

With Werber's insulator in position, the whole output of current is forced into the patient at the point of contact, and being diffused through intervening tissues is re-collected by means of a second electrode held in firm opposition with the first, and is thence re-conducted to the distal extremity of the discharge rod, or beyond the insulating section, and is thence discharged in sparks through the opposite pole to the ground; the strength of the spark-gap regulating, as before, the compression to which the current is subjected.

The writer often used the connections as shown in Fig. 1. The improvement showing at "A," turns the whole output of the machine into the human body or other object interposed in the track of the current around the insulated section of the discharge-rod, and from the body it is reconducted to the extremity of the discharge-rod and the increased tonic and alterative effects are produced, as heretofore, by discharging it in sparks through the opposite pole to the ground.

Dr. Werber claims for this modification of the wave current: That the entire output of the machine is utilized as a working current instead of a small fractional part of it, as in Morton's use of it.

That all the current is caused to pass through that part of the body or other object interposed between the electrodes in covering and re-collecting the current to be dissipated by sparks and before the intrapolar interruptions are made.

That the voltage, electro-motive force, of the working current is therefore much greater, than when only a fractional

part of the current is available. This will obviously increase the effectiveness of machines, and will check the desire for building new machines larger in size, generating stronger cur-

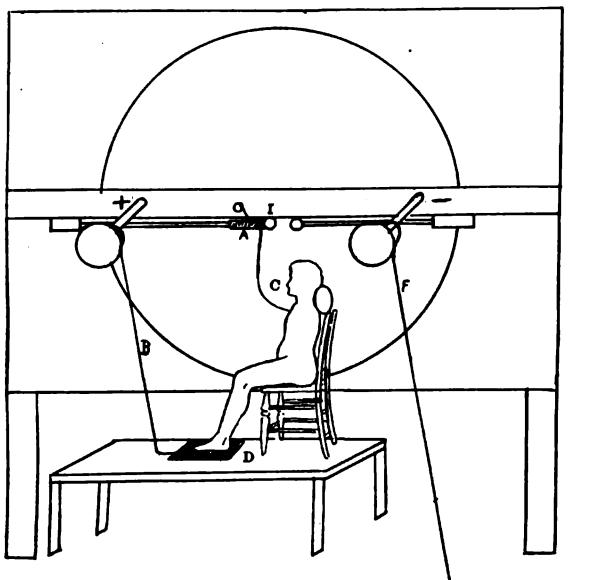


FIG. I.

A. Werber's insulator, which is made in the present case of hard rubber six inches long. O, insulator, is connected to rod by screw thread. I, small ball, is connected by a socket to insulator. D, metal foot-piece on platform connected with large positive ball, instead of the usual metal crutch. I-C, insulated wire conductor, going to C, neck and upper spine of patient. F, chain grounded from negative pole. B-D, may be substituted by the usual brass crutch, or the same may be added to the current.

rents, as machines of lesser size will generate a current sufficiently large for our purpose.

4. That the tonic and alterative effects produced by the interruptions of the current are exerted most vigorously at the point of exit from the body, under the return electrode, instead of at the point of entrance as formerly, and to which little power of compression could be applied.

5. That this interrupted current is under perfect control, and can be made to pass from the center to the periphery or in any direction.

6. That urging the whole volume, with increased electro-motive force, the current will produce better results with a less

umber of séances and of shorter duration, resulting in economy of expense to the patient and time to the operator.  
or a different modification:

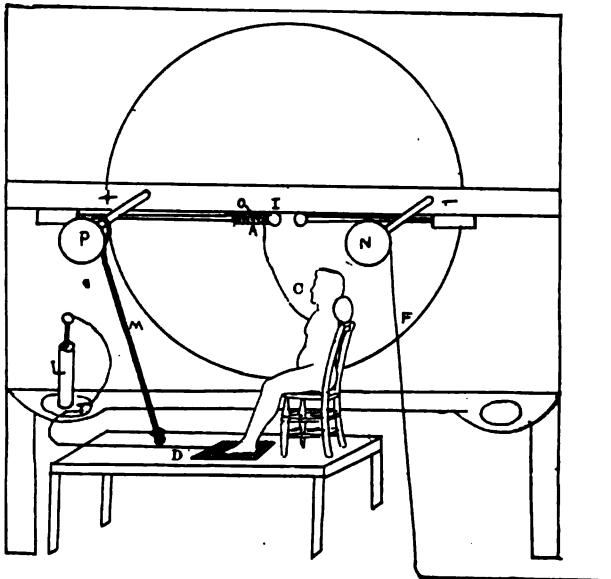


FIG. 2.

Werber's insulator. O, screw connecting insulator, D, wire foot-piece on platform, from Leyden jar, L, to D. L, Leyden jar standing free on front, connected to screw, S, and with another wire from the same screw, S, to piece, D, on platform. M, metal crutch from large pos. ball, P, to platform. C—C neck of patient, where block-tin electrode is applied, leading from C. F, chain, grounded from negative pole.

The writer has used the wave current almost daily for many months and has noted carefully the results as used first and in the addition of Werber's insulated terminal, and from observations it seems clear that some of Dr. Werber's claims are well founded, for operators who use the wave currents say that they generally require a protracted séance of forty minutes, or more, to accomplish the desired results. The writer has the time above stated correct, and when he has used the insulated terminal he has been able to accomplish the same results in about ten minutes, which, it will be seen, is in accord with the theory and claim of Dr. Werber. In neuralgia and local neuralgia five to ten minutes has always sufficed to arrest all pain.

The electrodes should be made of block tin, sheet lead, or another metal easily molded to the contour of the body, and they may be made of various sizes and shapes to meet different indications. A piece of lead tubing, bent to conform and held in position with a strap, answers well for the colon. A strip one or two inches wide answers for the spine, and enlarged joints can be completely encased with the electrode. The smaller the electrode the more vigorous the local effects, and vice versa.

Conclusion.—The theory has been explained. My experience has been practical and shows that the theory and practice agree. It remains for further experiments to show to what extent the size of the cumulator balls will influence results. The larger the ball of course the greater the compression, but fewer the "waves" or intrapolar interruptions. My own belief is that the smaller balls and more rapid waves will be found to give better results, and the high-frequency current with rapid vibrations will more quickly restore health and tone to diseased or disordered tissues. Insulated terminal is exhibited, etc.

148 West Seventy-third Street, New York.

#### DISCUSSION.

Dr. William J. Morton said that he had examined Werber's insulator quite carefully. The printed literature on this subject consisted, he believed, in a description of a patent taken out by Dr. Werber. He failed to see how this modification was of as great importance as one would be led to believe from the statements made in the paper. The patient is introduced into the circuit, and the platform being insulated the circuit is completed through the patient. In the ordinary method of administering the wave current the entire patient received the charge, and by leakage was discharged. This was the beauty of it; one obtained the benefit of the local discharge, and by not providing an exit for the discharge the patient was placed in that peculiar vibrating state—call it what one would. This treatment of the entire patient seemed to be a good point. At the last annual meeting Dr. Morton said he had described on the blackboard what had been called "an insulating capacity." This provided for exit of the discharge to a screen of zinc. By this means the current was concentrated at two points. The insulated ball in the Werber modification was practically an insulated capacity, although different in form and general appearance. It might be that the Werber insulator was more

convenient and it was certainly ingenious, but the effect should be the same as in the apparatus which he had described and presented to the Association last year.

Dr. W. B. Snow of New York said he had been using a modification of this idea all summer, and had found it advantageous for local treatment and local effects when the weather was so humid that a long spark-gap could not be obtained in the usual way. He had found one difficulty—the external capacity was always the same, and consequently one could not vary the vibratory effect on the electrode connected with that ball; it would always be dependent upon the particular machine used. The other electrode would always be the stronger. In using these local vibratory currents the local effect was obtained, it was true, but the great advantage of the wave current was the ability by this method to obtain at the same time a general effect. Every physician at the present day should use a large static machine, as it alone would meet all of his requirements. Dr. Snow said he had claimed no originality for the modifications he had been using, but had described and published them last June. With a plate under the foot and another on the back of the patient, and the chair insulated by ordinary telegraph insulators, Dr. Morton's external capacity, described a year ago, could be easily obtained. Another method was by means of the Leyden jar. He did not wish to criticise Dr. Newman's paper, as it was certainly a valuable communication, but it was important that we should know everything possible regarding these valuable currents.

Dr. Corbett asked why the interruptor used for the X-ray could not be used with the chain attached to it instead of having the special apparatus described.

Dr. Alfred T. Livingston of Jamestown, N. Y., asked whether a spark-gap was left under the feet, and whether there was the same amount of vibration as with the single connection.

Dr. Snow said that the local vibratory effect would be greater, but the general effect would not be so great.

Dr. Werber, in conclusion, said that his modification consisted merely in increasing the electro-motive force of the machine. The action of such a current was to increase the elimination of deleterious matter from the system. The length of time required with the ordinary wave-current method had led him to devise this modification, which certainly did materially reduce the length of the séance.

## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN  
CONN.

Physician in charge Newhope Hot Air Sanitarium, Member American Medical Association, American Electro-Therapeutic Association, Roentgen Society of the United States, Connecticut Medical Society, New Haven County Medical Society, Yale Medical Alumni Association, etc.

## CHAPTER VI.

## SCIATICA.

This condition is more frequently a neuralgia or a neuritis than a rheumatism, and it results from intra-pelvic neoplasms involving the sacral plexus oftener than is generally supposed. When the infection does attack this nerve, however, the resulting condition presents distinctive clinical and pathological features which are sufficiently pronounced to demand a marked modification of treatment in many cases, and for this reason it is entitled to a special mention. The distinctive pathology consists of a true interstitial neuritis set up by and accompanying the rheumatic inflammation of the connective-tissue elements, and this sometimes persists so as to keep up pain and soreness in the part for weeks and months after the rheumatism has subsided. The same conditions may be induced as in a traumatic or any other neuritis, viz., swelling of the nuclei in the sheath of Schwann, which by pressure upon the axis cylinder causes interruption of its function and sometimes death at the point of pressure, followed by degeneration of the axis cylinder periphera. Hence we get the atrophy of groups of the leg muscles, so frequently seen in sciatica. Therapeutics must therefore be addressed to the element of neuritis as well as the rheumatism.

The treatment of the early stage should be the same as for rheumatic inflammation anywhere, viz., rest, local hot air to the affected hip, and some salicyl compound, and it has seemed to me that salophen usually gave better results in sciatica than any of the others. The body treatment every two or three days is of great assistance in this condition, through its influence upon general metabolism.

The principal modification of treatment, however, consists

of the addition of the electrical currents. As before stated, they play but a secondary part in the treatment of acute rheumatism elsewhere when hot air is obtainable, but in sciatica they are always of great service and sometimes cannot be dispensed with.

**Static.**—For recent cases the brush discharge for twenty or thirty minutes, or the wave current localized over the nerve back of the trochanter, and as far as the inflammation extends down the thigh for the same length of time, once or twice daily until the acute stage has subsided, does good service.

For the chronic cases, long, thick sparks over the course of the nerve, or counter-irritation with the massage roller or brass-ball electrode, may be alternated with the wave current every day or two. Sparks must be applied cautiously, as they will aggravate the trouble if used too soon, and some cases will be aggravated by them at any stage. In chronic sciatica, however, judiciously chosen and applied static modalities are of more value than all the other measures put together, with the sole exception of hot air, and these act extremely well in combination; static in the morning, hot air at night. The immediate relief of pain which usually follows static and thermal applications in these cases is one of the happiest of therapeutical experiences. The tonic action of franklinism upon the system at large is strongly in evidence under these conditions.

**Galvanic.**—Opinions vary as to the advisability of using the galvanic current in acute sciatica, and, as a matter of fact, when hot air or static are available it will seldom have to be considered at all. The immediate relief of symptoms due to its application is unquestionable, but is frequently followed, after some hours, by an aggravation of the same. In cases where these agents cannot be used, however, and even in some cases where they can, galvanism is useful, and may be administered as follows:

The positive pole should usually be applied, stable over the point of exit of the nerve from the pelvis, and the negative, stable, over the course of the nerve as far down as the pain extends. This usually means clear to the toes, and the current strength should be from 5 to 15 milliamperes, according to the patient's tolerance, for ten or fifteen minutes. Stronger currents are extremely likely to produce irritation enough to aggravate the symptoms. Very rarely in acute cases, but more

frequently in chronic, the reversed polarities give better results both as to sedation and permanent benefit. It can be ascertained which only by trial.

Faradic.—The rapidly interrupted current, from the long fine wire coil, acts powerfully as a sedative in this condition, but rarely accomplishes anything else.

It should be remembered that in some cases of this disease any application of any electric current will make the condition worse at any stage of the trouble, with the exception of the static wave, which I have never known to cause, or heard of causing, anything but benefit. It is needless to say that when such a case is encountered, electricity should be kept religiously away from it.

Nerve-stretching or other surgical measures are rarely, if ever, called for in true rheumatic sciatica. Personally I have never seen a case that would not yield to the remedies herein before mentioned. Unfortunately this cannot be affirmed of all the other inflammations and irritations that attack this nerve.

The question is sometimes asked, "Will not hot air alone cure rheumatism, without drugs?" Unquestionably in some cases, but in the vast majority it only temporarily relieves the pain. Some cases will get well without any treatment at all, but that does not justify restricting routine treatment to the *medicatrix naturæ*. Hot air alone will not do what it will when combined with drugs, and drugs alone will not do what they will when combined with hot air. When both are given together we know that recovery will quickly follow; when one alone is employed the recovery, duration of attack, and condition of patient, during and after the same, are all problematical. It can hardly be considered fair to the patient, or wise from professional standpoint, to fail in giving him the benefit of all the therapeutical resources at our command.

The subject of rheumatism has been treated at considerable length, because the different phases and their management exemplify pretty thoroughly the greater number of the principles which govern the application of hot air to all pathological conditions. It now remains to enumerate the advantages exclusively dependent upon its use in this disease, and which are as follows:

First, immediate relief of pain however severe, which relief may be rendered permanent by repeating the treatments a

often as the pain becomes troublesome; every four hours, if necessary.

Second, shortening of the duration of the disease, which usually lasts only from five to ten days when hot air is thoroughly administered in combination with well-chosen drugs.

Third, lessening of the liability of cardiac involvement because of the rapid control obtained over the pathological condition, whereby the infection is inhibited from further attacks upon other tissues.

Fourth, the lessened number and quantity of the drugs which it is necessary for the patient to ingest, because of the increase produced in the efficiency and intensity of their action at the seat of infection; hence rendering it possible to avoid drug intoxication.

Fifth, in many cases which prove intractable to other measures its employment will render possible the extinction of the trouble.

Sixth, when properly and judiciously applied, its use is never productive of any vicious after-effects; on the contrary, the patient's general condition is immediately and greatly improved.

## CHAPTER VII.

### SPRAINS.

In the treatment of these injuries hot air is as effective as it is in rheumatism. In nine cases out of ten, if a sprain is gotten under treatment by this agent within four or five hours after the injury, all traces of the trouble will have entirely disappeared in from two to four days. When we consider the ordinary course of repair in sprained joints under ordinary treatment, the significance of the above statement can be appreciated. Instead of weeks of painful confinement we have days, and as the pain is relieved immediately, the patient does not suffer. These two results of its application entitle hot air to a place in the first rank of remedial measures for this condition, if not to the first place.

As a sprain is usually sustained while the victim is in good health and as the lesion is not an infective one, there is no impairment of the general metabolic functions, hence the body treatment is rarely called for in recent cases. In older cases,

where the central nervous system has felt the evil influence of long-continued pain and loss of sleep, or in patients exhibiting a low grade of vitality, the body treatment is extremely and rapidly helpful, but ordinarily the local is all that is required.

Treatment.—A sprained joint rapidly becomes extremely sensitive to manipulation that disturbs the lacerated connective tissues about the ligaments, and when one comes under treatment, however early, the slightest movement will usually cause excruciating pain. Hence the wrappings should be applied deliberately and with the utmost gentleness, and in pressing the wrappings against parts that complain during treatment, this should be borne in mind. The treatment should be given for an hour and the degree of heat should not be less than 350° F., and in some cases will need to be pushed to 450° F. or 500° F. If the joint is superficial, the patient fairly thin, and little oedema is present, 350° F. will usually be sufficient; if, on the other hand, the injured structures are covered by large muscles or a thick layer of adipose or oedematous tissue, it will require from 450° F. to 500° F. The effect of the first treatment will decide the point. Twenty or thirty minutes will usually entirely relieve the pain while the joint is at rest, and I have never seen a case where it persisted for the whole hour.

After the treatment, if the patient desires to move about, the joint should be supported by an elastic stockinette bandage, so applied as to support the ligaments tension upon which causes pain. When sitting or lying down, however, no bandage is necessary, but the joint should be kept elevated. Attention to this latter point will frequently prevent the pain from returning at all. The treatment should be applied twice daily anyway, and oftener if return of pain demands it.

The application of liniments or any other after-treatment is uncalled for, and, although massage does no harm, I have never been able to convince myself that patients did any better under it, and have abandoned its use in this condition when hot air is attainable.

In older cases the treatment is the same and the relief of pain just as prompt, but the repair is slower in proportion, as the exudation and secondary changes in the tissues are extensive.

Adjunctive Measures.—When hot air is applied early, from three to five hours after the injury, any other measure will

ry rarely indeed require consideration at all. It is more rapidly curative and more effective in promoting the patient's comfort than any other measure now known, and I know of no medicinal agent that can hasten or intensify the results obtainable with it alone. In older cases, however, where exudation has taken place, other measures in combination with hot air are useful. The static wave current, static spark, massage, and alternating hot and cold douche, applied daily in alternation with the thermal agent, one in the morning the other at night, are efficient in the order in which they are named. The static wave is the best, and there is reason to believe that this modality may prove ultimately to be the equal of hot air in the treatment of these injuries, both early and chronic. Further demonstrations are necessary before a conclusive verdict can be rendered on this point.

Although the results of hot-air applications to sprains appear magical at first sight, yet, when the subject is considered from an analytical standpoint, it is seen that the agent produces its effects in the same way as does every other successful treatment of the condition, ambulatory or otherwise, viz., through its action upon the circulatory and metabolic functions. The greater rapidity of repair, and the greater effectiveness in the relief of pain, are due merely to the greater profundity of its physiological action, both local and through the spinal reflexes; and its general influence upon these functions is beautifully exemplified by its action in this condition.

The advantages exclusively dependent upon the use of hot air in sprains are as follows:

First, the rapidity of repair, which exceeds that produced by any other agent now known, and by reason of which general systemic impairment due to lack of exercise from confinement to the bed, chair, or house, is never induced.

Second, immediate relief of pain, which can be rendered practically permanent by repeating the treatments as often as the pain becomes troublesome.

Third, entire absence of any but beneficial after-effects upon the organism at large, no matter how frequently it is applied.

## A THEORY AS TO THE ROENTGEN-RAY ACTION UPON MALIGNANT NEOPLASMS.

BY WILLIAM HILL BEAN, PH. B., NEW HAVEN, CONN.

There is no question that the action of Roentgen rays upon malignant growths is beneficial, but how this action is brought about is not so certain. In fact, we have almost no data upon which to formulate a theory. Various opinions have been hazarded as to electrical and magnetic influence, but the same thought has been involved in all of these—namely, the destruction of the tumor cell. I do not think this is what happens at all. On the contrary, I believe the cells are restored to their normal condition, and while there may be, and often is, atrophy connected with the process, there is no necrosis.

In order to explain how this restoration may take place and why we should expect it rather than destruction, let us recall a few theories and facts which are to-day generally accepted throughout the scientific world.

All matter, organic and inorganic, is in a state of continual motion as regards its molecular or atomic structure, and this motion increases or decreases, as we go up or down the temperature scale, till it theoretically ceases at absolute zero. The motion is vibratory and depends, so far as its changes are concerned, upon the variations in the radiant energy acting upon the body of which the molecules are constituents. When the vibration is of sufficiently high frequency, the molecules break down into simpler forms, and the more complex the molecule the lower is the frequency of vibration necessary to produce this result. Radiant energy, or this means we have of raising the temperature of a body, is an ethereal vibration; consequently, one form at least of molecular vibration is governed by an ethereal vibration.

Light, in the ordinary use of the word, means the manifestations of those components of certain ethereal vibrations which go to make up that portion of the spectrum between and including red and violet; but here let us use it in its wider sense, meaning those ethereal vibrations which are propagated at right angles to the directions of their vibrations. Now while many chemical actions will not take place till a certain temperature is reached—i. e., certain molecular vibration period

attained—many others can be brought about by exposure to light, which may or may not change the temperature, but which manifestly must have influenced the molecular vibrations. This action differs in different parts of the spectrum, but from the lowest end to the highest the variation is due only to the different wave lengths, or what amounts to the same thing, the variation in frequency of vibration. Here we have another form of molecular activity influenced by another form of ethereal vibration.

In considering the phenomena and laws of sound we note that a body capable of giving out a musical note does so, not only when struck, but also in response to vibrations which come to it through the air from another vibrating body, provided only that these vibrations be of the same pitch, or an even multiple of it, and that the vigor of the response depends, for one factor, upon the approach of that multiple to unity.

Just what the relations are between chemical actions and vital activities we do not know, but the one so shades into the other in many places that it seems not improbable that the main principle of each is the same, namely motion, molecular or atomic. If the molecules of a body—either inorganic, organic, or protoplasmic—have a motion dependent upon an ethereal vibration; and the atomic constituents of their molecules have also a motion peculiar to that molecule to which they belong, these atomic movements must be influenced by ethereal vibrations, provided they be of the right kind and within a range compatible with the integrity of the molecule. We know that all forms of life are favorably influenced by light and heat; consequently, we may infer that these factors contain some form of ethereal vibrations which are capable of eliciting a responsive atomic motion peculiar to the molecule of the cell in question, but possibly so far removed from its own period of motion that the response is feeble (compared with what we could imagine), yet quite sufficient for its ordinary maintenance.

Just what the difference is between a cancer cell and an epithelial cell, or between a sarcoma cell and a connective-tissue cell, again we must say we do not know. But we do know that the difference, as regards activity, is comparatively great, and, as regards constitution, comparatively slight; and that the tumor cell represents a tendency to return to a more primitive

form rather than an advance in the developmental scale. In this connection we might see a similar suggestion in the chemical phenomenon of physical isomerism. From the above I would reason that the atomic movements of one are not greatly different from those of the other, and an ethereal vibration favorable to one would be corrective toward the other, provided it was strong enough to affect it at all, which is evidently not the case with ordinary light or heat under ordinary conditions. If, however, we could produce ethereal vibrations whose periods should be either the same or a near multiple of those of the atoms of the cell in question, it is evident we should get a more vigorous response. And if a cell had not wholly departed from its proper atomic motion (supposing such a thing to exist), we might expect a restoration of the proper motion, or, in other words, a return to the normal.

Now it is my idea that this is exactly what the Roentgen rays effect. The best evidence which we have at present regarding Roentgen rays is that they are ethereal vibrations of high frequency, propagated in the direction of their vibrations. But whatever be the character of these vibrations, it is evident that they produce beneficial results, and, as I have tried to point out, the action appears to be corrective and not destructive.

Considered in this light, the so-called "X-ray burn" (which is really a dermatitis) is just what we should expect as the result of any too prolonged stimulation, and the necrosis which sometimes follows the dermatitis is the logical outcome of an intense inflammation; especially if the body condition is such that we may infer the resistant power to be low, as it has been in most of these cases.

If the action is destructive we should expect some inhibitive effect upon bacteria; whereas the most elaborate experiments fail to confirm any such prediction. On the contrary, if the action is by means of an ethereal vibration, we should not expect inhibition or destruction, but either an increased growth or no effect at all; the former indicating a responsive atomic vibration, and the latter simply a failure to respond. This expectation would be in accordance with all experimental data at present available.

Again, if the action is destructive, we should expect the superficial cells of an ulcerating tumor to show some evidence

of this. On the contrary, they have quite a different appearance from that produced by any destructive agent we are familiar with. In fact, they have the appearance of increased, rather than decreased, vitality.

It might be suggested that, if all the tumor cells were restored to the condition of normal cells, the general appearance of the tumor would not be greatly changed. In answer to this, I would say that probably only the younger cells are directly affected. The mature tumor cells have probably so far departed from their normal condition as to be totally unaffected, and the changes that they are subject to will depend, for the most part, upon the nutrition they receive. We should expect an atrophy, and this is what frequently occurs; a firm, but smaller, mass remaining at the site of the tumor. Again, we not infrequently have complete disappearance of the tumor. In these cases, whether or not there is a phagocytosis in connection with the atrophy, the writer is now attempting to determine by a series of microscopical studies which will later be reported upon in full.



## SIMPLE METHODS OF TESTING STRENGTH OF GALVANIC CURRENTS BY MILLIAMPERE METER, AND ALSO OF USING A GALVANO- SCOPE AS A MILLIAMPERE METER.\*

BY ROBERT REYBURN, A. M., M. D., WASHINGTON, D. C.,  
Dean, Professor of Hygiene, Medical Department, Howard University.

It is always desirable for the physician to know the amperage and the voltage of the galvanic currents he is using for medical purposes. Many of the physicians who desire to use electricity for the treatment of their patients are unable to obtain electricity either by the direct or alternating street currents, and use galvanic batteries for their purposes. The galvanic batteries almost universally employed by physicians for medical use are the Leclanché cells, or some modification of them,

Recently the writer has been using with great satisfaction a battery called the La Clede battery, which is simply a cylinder of carbon with a zinc rod in the center, and employing the usual muriate of ammonia solution.

For testing the quantity of the electric current or amperage of the cells of a galvanic battery, we would recommend the purchase of a set of resistance coils, one of 1 ohm, one of 10 ohms, one of 100 ohms, and one of 1000 ohms resistance. These are cheap, and can be easily procured from any manufacturer of electrical apparatus.

If we want, for instance, to test the quantity of current or amperage of one of the cells of a Leclanché battery, we can easily do so by connecting the terminal wires of the battery to the milliampere meter and the 1000-ohm resistance coil (both, of course, being included in the circuit). The total resistance or obstruction to the passage of the current, then to be overcome by the current of the battery, is composed of the three following factors:

- 1st. The internal resistance of the battery.
- 2d. The resistance of the 1000-ohm resistance coil.
- 3d. The resistance of the milliampere meter.
- 4th. The resistance or obstruction to the passage of the current of the wires connected with the battery.

\* Read before the American Electro-Therapeutic Association at Buffalo, September 26, 1901.

The milliampere meter used in the following measurements was one made by Waite & Bartlett, the internal resistance of which is 13-100 ohm.

The total resistance or obstruction to the passage of the galvanic current will be as follows:

- 1st. Resistance of coil, 1000 ohms.
- 2d. Internal resistance of battery cell, (about) 2 ohms.
- 3d. Resistance of milliampere meter, 13-100 ohm.
- 4th. Resistance of connecting wires, (about) 1-10 ohm.

On looking at the above it will be seen that the resistances of the milliampere meter and the connecting wires are so minute that they may practically be disregarded. The electro-motive force of each cell of the battery is 1 1-2 volts, and if we divide the electro-motive force by the resistance, we will have the fraction 15-1002, or practically the 2-3 of a milliamperes for each cell used (when the resistance is 1000 ohms).

On examination of the accompanying table, it will be seen that the quantity of current is increased by about 2-3 of a milliamperes for each cell added until it reaches 8 cells. As we add additional cells into the circuit, the quantity slightly increases to nearly 1 milliamperes per cell, and when we reach 30 cells the quantity of current passing reaches 29 milliamperes.

TABLE I.

Tables showing readings of milliampere meter from La Clede cells with resistance coil of 1000 ohms, placed in circuit.

No. of Cells	Milliampere	No. of Cells	Milliampere
1	. . . . .	16	13.4
2	. . . . .	17	14.4
3	. . . . .	18	15.4
4	. . . . .	19	17.
5	. . . . .	20	18.
6	. . . . .	21	19.
7	. . . . .	22	20.
8	. . . . .	23	21.
9	. . . . .	24	22.1
10	. . . . .	25	23.1
11	. . . . .	26	25.
12	. . . . .	27	26.
13	. . . . .	28	27.
14	. . . . .	29	28.
15	. . . . .	30	29.

The above Table I. not only gives the quantity of current produced by 1 up to 30 cells (with the resistance of 1000 ohms), but also, by a little calculation, gives the resistance

of the body of the patient, through which the current passing.

If, for instance, we pass the current of 22 of these cells through the body of the patient, and find that 1 milliammeter shows 40 milliamperes in place of 20, as given in the table, we know that the resistance of the patient's body is 500 ohms. If we pass the current of 22 cells and find that the milliamperc meter shows 80 milliamperes passing, we know that the patient's resistance is 250 ohms.

A table of this kind can easily be made by every physician who possesses the requisite resistance coils and milliammeter, and will enable him to know exactly the quantity of galvanic current he is using, and also enable him to measure the electrical resistance of the part of the patient's body he is operating upon.

TABLE II.

Tables giving comparative readings of milliamperc meter and galvanoscope (showing how a galvanoscope can be used as a substitute for a milliamperc meter).

Of Milliamperc	Corresponds Galvanoscope	Of Milliamperc	Corresponds Galvanoscope
66	8°	24	63½°
100	.	25	64°
1	10°	26	64½°
2	20°	27	65°
3	28°	28	65½°
4	34°	29	66°
5	38°	30	67°
6	42°	35	70°
7	46°	40	72½°
8	48°	45	75°
9	50°	50	77°
11	52°	60	78½°
13	54°	70	80°
15	56°	80	82°
17	58°	90	83°
19	60°	100	84°
21	62°	150	86°
22	62½°		
23	63°		

Table II. was made by connecting in the electrical circuit an ordinary galvanoscope along with the milliamperc meter; when the milliamperc meter showed 66-100 or 2-3 of a milliamperc of current passing, the galvanoscope needle was deflected 8°; with 1 milliamperc of current passing it was deflected 1°, with 2 milliamperes of current passing it was deflected 20°, etc.

This table shows that it is quite possible to calibrate

ordinary cheap galvanoscope and make it serve all the purposes of a milliamperc meter. The galvanoscope used above is one of Queen & Co.'s make, and is graduated by means of an engraved metal scale, to  $360^{\circ}$ .

Of course we would not want to be understood as claiming that the galvanoscope, when used in this way, can compare in delicacy of its readings with a fine milliamperc meter, but its portability and capacity to stand rough usage give it some great advantages over its more delicate rival.

It is quite interesting to examine the above table and see how the readings of the degrees of the galvanoscope change as the quantity of current increases. The change, for instance, when from 1 to 2 milliamperes of current gives a deflection of  $10^{\circ}$ . As we increase the number of milliamperes of current the deflection rapidly diminishes. When we reach the interval between 50 and 100 milliamperes, the galvanoscope gives only a deflection of  $7^{\circ}$ , and the interval between 100 and 150 milliamperes gives only a deflection of  $2^{\circ}$  in the galvanoscope.



## ELECTRIC LIGHTING AT THE PAN-AMERICAN EXPOSITION.\*

BY HENRY RUSTIN,

Chief of the Mechanical and Electrical Bureau of the Pan-American Exposition.

To come before your Association is a compliment which I certainly appreciate. I have not attempted to bring before you any description of the lighting, but desire to draw your attention to some few points which may be of interest.

The aim of Exposition decorative lighting is to produce a complete picture with lights—something to arrest attention and to attain, as far as possible, an effect which will in itself have as much of character and individuality as the architectural or sculptural effects.

It must not be understood that the lighting can be independent of the architecture, for if such were the case, some attempts might soon be made to have lighting without the setting necessary to make it a success. Perhaps the essential requirements of a successful night illumination are furnished first by the architects who compose a pleasing ensemble of arrangements of buildings, although it is not essential that architectural lines be absolutely adhered to in the lines of illumination.

The character and unit of lighting—that is to say, the size of lamps—has much to do with the effect produced; again, the tint of the building or background comes in for consideration.

It is evident that a large unit or lamp against a light color would serve to produce, with neighboring lamps, so broad an outline as to be out of scale and, by example, like attempting fine penciling with a whitewash brush—while against a dark background a large unit would only appear the size of the glowing filament contained within it. Uniformity of the lamp itself comes in, too, for a great share of the success of the decorative lighting work; this point is too often overlooked. I am certain, however, that the whole Pan-American Exposition's nightly picture would have been less pleasing had lamps of different makes, or rather lamps rated and constructed by different methods, been adopted.

\* Read before the American Electro-Therapeutic Association at the annual meeting held at Buffalo, September 27, 1901.

The development of the lighting plan of the Exposition was, however, not only along lines for a total when viewed from between the pylons of the bridge, but careful attention was also given to produce an even unit of illumination for the grounds and objects contained within the area of the courts. For this a set rule was adopted, and few deviations from the unit established have been made, the close adherence to a unit scale of illumination resulting in clustering of lamps on posts, but not to an extent which offends the eye by day or night. Those in charge of structural designing evolved a form for lamp support which admirably served the purpose, and which is most attractive in appearance—yet with all the incandescent lamps nightly in use, as material substance, they do not constitute much matter. The glass forming the globe is almost as thin as writing paper, and the filaments of all the lamps, if reduced to powder, would hardly fill a teacup.

Much has been said about the impossibility of ever again producing an equal quantity of illumination elsewhere, because of the rare advantage of proximity to Niagara Falls. This is an error, for eighty tons of coal nightly, four carloads, would easily accomplish an equal display.

What will not soon occur again is the application of an immense power-transmission plant to such a purely spectacular display. As a rule, a plant of this size, requiring so great an outlay of money in constructing, would prearrange its sale of power to, as nearly as possible, its capacity and leave little opportunity for furnishing temporary current to so exacting and so large a demand as an Exposition's requirements.

An Exposition's requirements are not those found in ordinary commercial service, and for that reason a commercial plant cannot properly serve, nor, on the other hand, would it welcome such a customer after one experience.

Where the story of Niagara Falls really applies in lighting, and to good advantage, is in the relating of the history of long-distance transmission and the success attained in furnishing the energy for this great display of light for decoration at a distance of twenty-four miles. For advertising motives, this links the great falls with the Exposition, and furnishes a popular demonstration of what is possible by approved modern methods in electrical work.

It is not commonly known that the electrical service of the

Pan-American Exposition comprises nearly every branch of the art and includes provision for the installation of primary and secondary batteries, motors for a great variety of voltage (both direct and alternating), telephones and telegraph instruments, projectors and moving-picture machines, alternating current for every commercial phase and frequency. Many of these services are obtained from the steam-power plants on the grounds. The electrical plants on the Exposition grounds, three in number and totaling about 10,000 horse power, are as follows: The transformer plant in the Electricity Building, which receives its supply from the Niagara plant at Niagara Falls, transforms current from a pressure of 11,000 units to 1000, and distributes current around the grounds to the individual Exposition buildings and exclusively for the incandescent lighting. The service-power plant, located in the northwest corner of the Exposition grounds, is a steam plant and serves the western portion of the Midway with incandescent lights, as well as service for projectors and arc-lamps. This plant also takes care of the arc-lamps required for lighting the interior of the main buildings.

The exhibits plant, located in the Machinery Building, is a pumping station, serving the fountains and water display, but, in addition to this, gives electrical service to the motors and apparatus in the Machinery Building used by exhibitors in the main building. These plants use the exhibit apparatus of over thirty-three different manufacturers.

The pumping station above referred to is in itself an interesting display of machinery in motion, and forms a very important part of the Exposition motive power. It serves to put in motion the entire fountain display in the Court of Fountains and in front of the Tower, and handles about 77,000 tons of water a day. This quantity of water is discharged from the waterfall in the niche of the Tower and from the several groups of jets making up the water display in the basins.

I have referred above, in brief, to the transformer plant in the Electricity Building. The transmission line which supplies this takes current from the Niagara lines at the city limits and at a pressure of 22,000 volts. It is at once stepped down to 11,000 units and delivered to the Exposition's overhead line about a mile in length and brought to the fence line, and there passes through three rheostats. These are used in producing

the build-up of light from zero candle power to full brilliancy, and occur one in each phase of the three-phase 11,000-volt line. They are extremely simple in construction and consist of three separate wooden water tanks, size 3 ft. x 3 ft. x 8 ft. In each of these is a clip, to receive the blades of a big knife-switch 7 ft. long. Each clip is connected to its underground conductor and each blade to its overhead conductor. The flow of current is gradually increased as the distance between contacts decreases during the process of closing the knives into place, and the lights then gradually build up candle power. From here the line passes underground to the Electricity Building, through a three-conductor cable. Two of these cables have been installed, the extra one being used only in case of emergency, such as a break-down of insulation in the one in use.

At the conclusion of his paper, Mr. Rustin made the following remarks:

A rheostat serves for the nightly build-up from no candle power to full candle power. In each of three tanks is placed a large cast-iron knife, hung to a hinge, and controlled by a rope actuated by a motor. At the time of the build-up each night this motor is put under control, and gradually the knives sink into the water, producing a greater area and a less resistance until they finally give the lamps full candle power by coming down into the contact points in the rheostat.

#### DISCUSSION.

Dr. W. J. Morton: How far can you practically extend this lighting from the source of power?

Mr. Rustin: There is one distributing station on the grounds which distributes 1800 units. The Niagara plant has a distributing plant at the Falls, twenty-four miles away from here, for 22,000 volts. This is practically the radius of limit in this plant. Climatic conditions have much to do with the action of such a system—in other words the distribution depends upon what insulation is practicable for a given climate.

Dr. J. D. Gibson: How far can the power be economically carried?

Mr. Rustin: The only limit is the pressure to which the voltage can be raised. There are plants in Southern California where the climatic conditions are very favorable, and where they operate 60,000 volts and carry the current from 140 to 160 miles for certain services. There certain services which, under a low price per unit of power, can be utilized to advantage for

a great distance. Many of the services in that part of the country are for pumping for irrigation ditches. The time at which these pumps operate can be pre-arranged, and if the plant which is serving its customers around a closer radius make the peak of the load occur between eight o'clock in the morning and six at night, the party wishing to use the power for irrigating purposes can employ the power at any time—in other words, in the cheaper hours, and hence he can afford to stand a greater loss.

Dr. G. Betton Massey: Does the current go through the water of the rheostat first; is it partly a water circuit at the beginning?

Mr. Rustin: Yes, the current goes through the water. This knife-blade is shaped like a butcher knife, very much worn. At the end near the handle there is a projection or heel, and that never leaves the water. Every light, the power of which comes from Niagara Falls, is controlled in the same way. The shutting down of the light for about 120 seconds causes no great inconvenience. We use about 150 amperes as a maximum in each phase—i. e., in each one of the boxes.

Dr. Robert Reyburn: What is the amount of leakage or difference of potential between Niagara Falls and here on the main circuit?

Mr. Rustin: The wires are entirely overhead until the Exposition grounds are reached. The loss of energy I cannot state, because I am not certain of the economy of the different transformers through which it passes. In our transformers on the Exposition grounds we have figured out that about 100 horse power are consumed in the transformers out of a total of 5000 when they are all in operation. The first process is to raise the voltage from 2200 to 22,000 and then it is brought along the line to the outskirts of the city. Here it is reduced to 11,000, and then we drop it to 1800 before distributing it around the grounds. The final dropping at the lamps is to 104 volts.

Dr. A. T. Livingston: What is the transverse area of the wires bringing the current from the Falls?

Mr. Rustin: The original line was 300,000 circular mills. The new line is an aluminium line, and has an equal carrying capacity; it is something near 450,000 to 500,000 circular mills. The actual ohmic resistance is not a great matter at that pressure. The transformer losses in the apparatus itself are more important; the actual line loss is not very great at 22,000 volts. Of course, the larger the conductor the less the loss in the line.

## Editorial.

### WANT OF PROFESSIONAL KNOWLEDGE UPON IMPORTANT SUBJECTS.

DROBABLY at no time has the lack of professional knowledge been more keenly felt by members of our profession than now when it dawns upon the world that the X-ray is to be a factor, not only in diagnosis, but in making encroachments upon what has been exclusively the surgeon's field of operation.

Those who in their own domain have learned to advise and to things which require great skill are too apt to presume that they can take the upper room in other departments, in which they are entirely ignorant of the rudiments.

It would be as reasonable for a physician who had acquired no skill in surgery to attempt to perform a laparotomy as for a surgeon who did not know a volt from an ampere, or a high tube from a low one, to employ the X-ray in the treatment of cancer, without acquiring the requisite technique.

This same lack of proper knowledge a few years since resulted in many accidental X-ray burns, as well as the production of skiagraphs so distorted as to be of no value whatever. The X-ray fell for a time into almost general disfavor for purposes of diagnosis, and so it will in untrained hands in the treatment of malignant disease, if it is to be employed by the inexperienced, who may at the same time have another and more profitable way of doing the same thing.

The treatment of cancer by the X-ray requires a kind of knowledge and judgment which has no relation to the surgeon's art, and which must have as much study, skill, and adaptation on the part of the operator as surgery. When it is realized fully, as it soon must be, that electricity is to fill a great place in the medicine of the future, and the men who stand high in the councils of the great medical colleges, and who themselves from neglected early education know little or nothing of the subject, begin to see that it is not to be ignored, then, and not until then, will the education of the younger medical men in this department receive attention, as it does to-day in subjects of far less significance.

When men who are not well informed in the employment of electricity realize that it is a dangerous agent in ignorant hands, and not until then, will the records it so well merits from skillful employment place this valuable measure in its proper sphere as a therapeutic agent.

The need of such education is keenly felt and sought by the enterprising physician who sees its value in the results. The man who attempts to work out the technique finds it is a tedious and unprofitable process.

Not alone does ignorance exist in the use of electricity, but the same is equally true of the employment of hot air, hydro-therapeutic measures, therapeutic exercise, and light—natural measures which should appeal to all.

\* \* \*

### THE NEW SCHOOL OF PHYSICAL THERAPEUTICS.

DURING the past few years the increasing interest in the employment of electricity has induced the organization of schools and correspondence schools for the purpose of aiding the members of the profession who sought instruction in methods not taught in the medical schools which they had attended. There are other methods which, while receiving more attention, perhaps, than electricity, that have not been given proper significance in the great medical schools of the world.

Natural measures will very largely constitute the physician's means in the future. Imbued with the truth of the last statement, leading physicians, who have devoted themselves to the study and scientific employment of the measures properly constituted as physical measures, have founded a school for post-graduate instruction.

The New York School of Physical Therapeutics will have chairs devoted to the methods of employing electricity, heat, cold, light, water, and mechanical measures, as well as the systematic employment of exercise and diet to the prevention and cure of disease.

The school has been organized under favorable auspices, having the co-operation of a body of able men who have the courage of their convictions.

## **Progress in Physical Therapeutics.**

### **GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.**

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

*Electricity in Gynecology.* By Clara E. Gary, M. D., from Homeopathic Journal of Obstetrics, Gynecology, and Pediatrics for March.

In gynecology, electricity has a place that can be occupied by no other therapeutical agent. Electricity will not cure every case, but when any measure has been efficient in at least seven-eighths of the cases treated, as recorded by one physician, naturally we would call it a success; this has been our experience after nearly sixteen years' hard work in this direction. It has its limit as well as any other remedial agent, and should not be used in obscure cases which have baffled diagnosis, both physical and electrical, unless it is with the distinct understanding that the treatment is experimental.

The field of electro-gynecology is limited at the present time to certain diseases. Those which we have found especially amenable to the influence of electricity are chronic endometritis, pelvic inflammatory exudates, some varieties of fibroid tumors of the uterus, amenorrhœa, dysmenorrhea, and displacement of the uterus.

We use galvanism, faradism, and the sinusoidal currents in the before-mentioned diseases. In galvanism, the polar effects are important, also the electrodes employed. A current of sufficient strength will produce at the negative pole an alkaline caustic effect; this pole is also a vaso-dilator and an irritant to the sensory nerve. At the positive pole, a strong current will produce a dryness of the tissues and also an acrid, caustic effect; the metal of which the electrode is composed will become affected by the acid pole, and the salts of the metal will be produced, which in turn will affect the tissues and also destroy pathogenic bacteria; this pole is a sedative to the sensory nerves, and a vaso-constrictor. The faradic and sinusoidal will contract striped or unstriped muscular fibers, and will stimulate local nutrition.

First, endometritis, which we all understand is an inflammation of the membrane lining cavity of the uterus. In the first stage, where we have turgescence of the vessels, uterus enlarged, sensitive, and low in pelvis, or where the discharge is purulent, streaked with blood, acrid, and irritating to the cervix; we use the sinusoidal current to obtain a sedative

effect. The patient should not be conscious of any discomfort, the current should be started gradually and should be turned off gradually before the electrode is removed; it should only be employed a little while at a time, that the patient may not be fatigued. In the hospital, it can be used twice a day bipolar. The galvanic current is not tolerated until inflammatory conditions are over. In the chronic condition, we use a pure copper intra-uterine electrode, large enough to fill the uterine canal, in order that it may come in contact with the whole of the diseased surface at one time. This electrode is attached to the positive pole and held stationary. Place the indifferent electrode upon the abdomen, the current should be turned on gradually and turned off gradually, using not over 25 milliamperes about three minutes, increasing the time every second day until five minutes are occupied. It will be understood that the current must be strong because there is less resistance, on account of so much more moisture within the uterus than there is on the surface of the body and skin.

Planet, first assistant to the late Apostoli, and Gautier of Paris, have used with success in these cases a platinum electrode wrapped about with absorbent cotton and dipped in a solution of iodine of potassium 1 to 10; the electrode is then inserted into the uterus and attached to the positive pole; chemical decomposition takes place; the iodine is set free at the positive pole, and the potassium at the negative pole; the iodine penetrates into every depression, and into the deep submucous structures; we use heavier currents in these operations, as high as 80 milliamperes. Aside from the cauterizing effect, we have the effects of the positive pole, which are peculiar to itself, as before explained. Sometimes a positive electrode cannot be removed without using force; if so, reverse the polarity for a few minutes until the softening effect of the negative pole is evidenced. Constitutional measures are important, and remedial agents should be employed at the same time.

**Pelvic Inflammatory Exudates.**—We use galvanism in these cases where there are old inflammatory exudates, thickened broad ligaments, adhesions, old exudates surrounding the uterus, carefully avoiding cases where there is encysted pus. The negative being used as the active electrode, it being covered with moistened absorbent cotton and pushed into the posterior cul-de-sac, or intra-uterine or rectal electrodes as the case may require, 25 to 40 milliamperes are used, according to tolerance, for five minutes; the treatments of these cases sometimes spread over six months, but are most gratifying in their results. It may be interesting to note here that Apostoli advocated the use of electricity in active inflammatory conditions of this kind, and his skillful assistant Planet still carries out Apostoli's idea. The treatment consists of the

bipolar intra-uterine application, faradic current of tension with occasionally a little galvanism. They claim it is criminal to let the disease alone and allow it to run its own way; we have used it a few times with varying success.

**Amenorrhœa.**—When there is considerable development, but not enough to come up to the standard for perfect development, and the patient is still young, much may be done to assist nature, also in amenorrhœa due to fright, grief, or a cold, when patient comes to you in an irritable and excited state, with full pulse, high temperature, sleeplessness, no appetite; rest and remedies may relieve the symptoms, but the menorrhœa continues. In such cases we find electricity valuable.

**Dysmenorrhea.**—Whatever may be the difficulty, whether an accumulation of menstrual blood above a slight stricture or whether it is an obscure nervous action, relief can be obtained by electricity. Strictures of the uterine canal usually occur at the junction of the neck with the body. It takes longer to dilate the internal os by electricity than by other means, but it is accomplished with less pain, and is lasting in its effect. The method is to introduce a bulb electrode of moderate size, attach to this the negative pole, positive pole on the abdomen; press the bulb electrode firmly against the contraction, using 10 to 12 milliamperes, keeping up a firm pressure against the stricture until it passes through it. In two or three days give another treatment, using larger bulbs, and so on until the stricture is removed. Should the dysmenorrhea still remain, use positive intra-uterine galvanism, copper-electrode, negative clay electrode on the abdomen twice a week until the patient is relieved.

**Displacement of the Uterus.**—In these disorders both the faradic and the galvanic currents may be used, according to their indications; bipolar faradism for strengthening the uterine supports and galvanism to exert a tonic curative effect upon the uterus and its lining membranes, which are usually inflamed in these conditions. Overcome the rigidity of the uterus in all cases with a negative electrode, then use the positive electrode for tonic effect and for the cure of endometritis. Use the faradic current first through the fine wire, and then, second, through the coarse wire. By following out the simple rules laid down in the first part of this paper, of course with variations, according to each peculiar case, the operator will find electricity exceedingly useful in all displacements of the uterus and their accompanying disorders.

**Fibroid Tumors of the Uterus.**—As fibroids were first successfully treated by Apostoli, we will speak of his method as given to us by his assistant Planet. Apostoli did not believe in interfering with fibroids, if there was any pain or any hemorrhage. He considered that the menopause settled the

matter, and if the patient was thirty years old or thereabouts, and there were pain and hemorrhage, he considered it difficult to bring her to the menopause; on the other hand, if the patient was thirty-eight or forty years old, nearing the menopause, he considered that electricity was sufficient in certain cases, thereby avoiding an operation. Apostoli's method was as follows:

Positive electrode introduced into the uterus, negative clay electrode placed upon the abdomen, positive electrode composed of platinum; use it without introducing it through a speculum. First treatment: Start the current slowly, and increase gradually to 50 milliamperes for five minutes; shut off current slowly in order to prevent contraction; use care, in removing the electrode, not to burn the parts; compel the patient to rest in a recumbent posture for two hours after the application; should hemorrhage occur the next day, oblige the patient to remain in bed until hemorrhage has ceased. Never operate more than three times a week; increase the current each time, if the patient can tolerate it, until 100 or 150 milliamperes are reached. We consider that typical cases for the successful treatment of fibroid tumors of the uterus by electricity are those of the interstitial variety, for they are usually hemorrhagic, and the hemorrhage usually occurs as an exaggerated menstrual flow.

There are many other pelvic disorders which are amenable to electrical treatment, and bring about gratifying results to the operator.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

From the current medical literature of this specialty we find in Pediatrics, N. Y., March 1, "Anomalies of the Prepuce in the New-Born," by Wm. J. Greenelle; in American Practitioner and News, Louisville, February 15, "Surgery of the Urinary Bladder," by John R. Wathen; in American Journal of the Medical Sciences, Philadelphia, March, "The Clinical Significance of a Chronic Urethral Discharge," by H. M. Christian. The author discusses the different forms of urethral discharge, their appearance, microscopically and macroscopically, causes, etc., and gives a table showing the difference between true gleet, prostatorrhea, and urethrorrhea. Medical Summary, Philadelphia, March, has "The Difficulties of Treating Enuresis in Children," by M. McCreary.

*A Suggestion in the Technique of Suprapubic Lithotomy.* By Chas. Chassaignac, in New Orleans Medical and Surgical Journal, March.

The technique suggested by Chassaignac consists in the following principal features: "1. Introduction of stitches in a special manner to hold the bladder while it is incised and the calculus extracted. 2. Utilization of the same stitches in the closure of the bladder. 3. Formation of temporary drain by the collection of ends of catgut stitches. 4. Drainage by means of the Pezzer self-retaining catheter during the healing process." The details are given at length, but for lack of space cannot be reproduced here. He thinks this method is of special advantage in cases where it is advisable to close the bladder completely, but it might be used on occasions where it may be thought best to close it only in part, using the two supporting threads as the limiting suture at each end.

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*Extra-Genital Chancres, with Illustrations and Report of Cases.*  
By M. Goltman, Memphis Medical Monthly, March.

The subject of innocent syphilis is discussed by Goltman, who notices some of the statements of authorities in regard to the matter and describes the principal avenues of infection. He thinks that the local abolition of syphilis would be impossible, but the innocent acquirement of the disease may be avoided without doubt, and offers the following suggestions to this end: "1. Physicians should give their syphilitic patients explicit hygienic instructions, which would be better printed in booklet form. In my opinion a physician neglects a positive moral obligation if he fails in this. This, in my judgment, is the keynote of all prophylaxis, since all cases come under the physician's care sooner or later. 2. The habit of promiscuous kissing should be inveighed against—four of my five cases have been infected in this way—and much care should be exercised in the selection of servants, particularly nurses. 3. Barbershops should be governed by proper legislation embracing a knowledge of the rudiments of the science of contagion, asepsis and antisepsis. 4. Physicians and dentists would do well to make examinations with more care and to perform minor and other operations with more deliberation. 5. The hygiene of industrial life should also be regulated. This would have a tendency to lessen other diseases besides syphilis, and could readily be done by disseminating the proper literature."

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*The Prostate.* A leading article on this subject in the Journal of the American Medical Association, March 22, 1902, is by John B. Murphy, A. M., M. D.

It treats of the recent prominence of surgery of the prostate, anatomical consideration, physiology of the organ, aetiology of

prostatic enlargement, pathology, medical treatment, prostatotomy, Bottini's operation, and the article will be continued.

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*Proteosuria.* American Medicine, Philadelphia, of March 8, 1902, has an article by H. O. Mosenthal and Wm. J. Gies on proteosuria.

Among the proteid products occurring in the urine under various conditions are proteoses, which seem to be chemically identical with those formed normally in the gastro-intestinal tract during the digestion of albuminous matter. Mosenthal and Gies have investigated the statement of Freund in regard to the method of detection of peptone in the urine and faeces and point out that he has given a rather wide signification to the term peptone and seems to have had proteoses in mind. His method is a simple one, consisting in acidifying 10 c.c. of urine with acetic acid and then treating with twenty per cent. neutral or basic lead acetate. The milky mixture is then boiled thoroughly, and the precipitate filtered off. The filtrate is then treated with potassium hydroxid, as long as lead hydroxid continues to form. The mixture is then boiled again for a minute or two. The filtrate, it is claimed, is entirely free from urobilin and contains a little more than ninety per cent. of the proteose originally present in the urine. This may finally be detected with the biuret reaction. From numerous experiments to test the validity of this method, examining not only urine and faeces, but normal urine treated with Witte's peptone, gelatins, various diuretics, albumin, ox blood, gastro-intestinal mucus, etc., positive results were obtained, though they should not occur in the normal excretions. The results show, they think, that Freund's method is not a differential process and cannot be safely applied to the urine or faeces as a peptone test. They show that the peptones, proteoses, and gelatins may each give positive results with it in the urine and faeces, and that sero-mucus in the urine might also affect the final reaction.

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Pennsylvania Medical Journal, Pittsburg, February, Operative Treatment of Bladder Descent and Sacculation. By J. C. Bateson.

Therapeutic Gazette, Detroit, February 15, An Unusual Case of Retention of Urine. By Charles E. Ziegler.

Medical Times and Register, Philadelphia, February, 1902, Impotence, Varicocele, Hydrocele, and Other Genito-Urethral Disorders. By W. H. Walling.

Medical Record, March 22, 1902, has an interesting report of a case of intra-peritoneal rupture of the bladder, by James Pedersen, M. D. A successful operation was made, with a perfect cure.

## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D., NEW YORK CITY.

THE subject of light-therapy is at this moment attracting the attention of the medical world to a considerable degree. The work of Finsen, based upon careful photo-biological research as well as clinical experience, has given it a wonderful impetus, and done much to establish it in the confidence of the profession. It will be the purpose of this department to discuss from time to time every source of light available for physiologic effect and therapeutic application, as well as mechanisms, their arrangement, and technique of administrations.

Status of the Finsen Method.—The tendency of the profession to use the higher and irregular frequencies of the X-ray in the treatment of local cutaneous and tissue affections, especially lupus vulgaris and the various forms of malignant disease, and the high degree of success obtained therewith, does not for one moment militate against the value of the chemical activities of light in the same pathologies.

The objectionable features of the Finsen method no longer exist; *i. e.*, expensive apparatus, excessive cost of operation, and prolonged séances. All of these conditions were modified by the improved apparatus of Lortet and Genoud \* where the entire chemical energy of the arc was practically utilized at its source before the short or high-frequency waves were lost or dissipated in transmission. More recently, however, a new lamp has been devised at the Finsen Institute, by Dr. Sophus Bang, which meets the needs of the physician much more fully, and, in fact, is an ideal means of utilizing the chemical rays of light. Instead of carbon, this lamp is provided with hollow iron electrodes, through which water constantly circulates. The spectrum from iron electrodes is extraordinarily rich in chemical rays, but poor in heat rays, and the result is an absolutely cold light of great chemical energy. By the cooling process, a crater of greatly diminished size is formed,

\* The Journal of Physical Therapeutics, London, July 15, 1901; "The Electric Arc: Its Physics, Physiological Action, Therapeutics, and Arrangement of Mechanisms," by Margaret A. Cleaves, M. D.

fusing of the electrodes prevented, and a maximum of the true activities of the arc—*i. e.*, short and high-frequency waves with a minimum of the long and low-frequency waves—obtained. The energy is expended in producing the arc, from which the chemically active radiations are emitted, instead of proceeding from the incandescent carbons, and especially the crater of the positive carbon, as with the ordinary arc. This lamp requires but 5 amperes at 40 volts, and has a bactericidal power sixty times greater than a 25-ampere lamp at 55 volts. The same therapeutic effects can be obtained in three minutes as in an hour with the original method (Finsen tube and 80-ampere arc). A characteristic light erythema—of the whole face, for example—can be produced in five minutes, at a distance of one meter, lasting for several days. The cost of operating a 5-ampere arc is but 1-16 of the Finsen tube with an 80-ampere arc. No assistant is needed, and the time of exposure is but from three to ten minutes. The treatment is absolutely painless, devoid of danger, without unpleasant reaction, and the best cosmetic effect is secured.

The results obtained by the Finsen method speak for themselves—650 cases of lupus vulgaris are reported, with 456 cures. In 130 cases no recurrences have taken place, although from one to five years have elapsed since their treatment. The only drawback to its use in this country lies in the fact that the lamp, which is patented, must be imported. It is known under the name of Darues, and has been introduced into commerce by the Société Electrique Tantor, Berlin. It is also manufactured in Copenhagen at the Fabrikant Warberg.

Unfortunately for the Finsen method, various manufacturers in this country are exploiting mechanisms under the name of Finsen apparatus, constructed with utter disregard of the physical laws governing the use of light by this method. Despite, therefore, the good work being done with the X-ray, the position of the chemical activities of light in local cutaneous and tissue affections remains impregnable.

Present Status of Light-Therapy in General Medicine.—The value of light-therapy is, however, by no means confined to superficial pathologies. It has a place in general medicine of much broader significance, as the writer has found in an experience of nearly nine years with the electric arc-light bath. Evidence is rapidly accumulating confirmatory of the clinical

observations\* reported nearly four years since, showing that the bactericidal action of the chemical activities of light obtains in tuberculosis pulmonalis as well as in superficial tubercular lesions. In 1895 the writer began treating pulmonary tuberculosis by means of the electric arc; utilizing not only the chemical, but the thermal and luminous rays as well, and also the ozone generated during the activity of the arc. In the report above alluded to, six cases of pulmonary tuberculosis were reported, five of acute and one of chronic phthisis; also cases of subacute bronchitis, eczema, and psoriasis. Since that time additional cases of tuberculosis, subacute and chronic bronchitis, bronchial asthma, convalescence from grippe and broncho-pneumonia, characterized by constant harassing cough as well as profound exhaustion; primary and secondary anaemias, neuritis and neuralgias, seborrheic eczema, eczema, psoriasis, and acne, have been treated with excellent results.

In the treatment of all diseases of the respiratory system, as well as in catarrhal conditions of the nasal passages, there have been secured certain definite and invariable results: viz., improved respiration, fuller and slower, with gradually increasing respiratory capacity; diminished irritability of the mucous membranes, and lessened discharge. Improvement from the harassing cough has invariably been noted from the first exposure.

In a case of acute phthisis included in the above report the bacilli which were abundant at the first visit, had disappeared at time of second examination of the sputum, two weeks and three days later, and were never found again during the three months the patient was under care. When last heard from, three years later, he remained well. Coincident with the diminution of cough and expectoration there was amelioration and subsequent disappearance of all the physical signs with improved nutritive conditions. Of the cases here reported all, save two, were dispensary patients, for whom there could be no change of environment nor dietary; two were incurable, and yet there was a modification of all the symptoms, with, in one case, healing of a chronic tubercular ulcer of the larynx in two weeks' time, and with but five exposures. Similar

\* Transactions of the American Electro-Therapeutic Association, 1898, New York Med. Journal, January 28, and February 4, 1899; "The Electric Arc-Bath," by Margaret A. Cleaves, M. D.

results have since been obtained by Doumer and Finsen, and in this country, 1901-1902, by Hopkins. More recently M. Foveau de Courmelles has had the same clinical experience with pulmonary tuberculosis, and has also treated tubercular glands, fistula, and joints, with good results. It is well established that the curative rays are the short and high-frequency waves, or chemically active radiations; still, in most pathologies, other than those of the skin, all the radiant energy of the arc is of value. In considering light-therapy the incandescent light has a place, but, in the conditions thus far referred to, the electric arc offers the best means of securing the greatest number of the chemical rays, as well as the highest value in radiant energy available from an artificial source. Sunlight is too uncertain in its appearance to be relied upon for therapeutic applications.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

*A Study of the Cases of X-Ray Burns Hitherto Recorded.* By E. A. Codman, M. D., of Boston, Philadelphia Medical Journal for March 8 and 15.

The writer has compiled with much care the gleanings from the literature of all countries. The total number of cases—which does not aggregate two hundred of all degrees, the larger portion of which occurred in the first year—shows a remarkably small list of casualties for the very large number of exposures that have certainly been made. It is a notable fact that but two cases were reported in 1901. With the remarkable increase in the employment of the X-ray for diagnostic and therapeutic purposes, it is significant that so few burns have been reported. The writer adds that "We may safely tell a patient to-day that there is not one chance in ten thousand of his receiving an injury from an ordinary X-ray exposure." "Obviously, this makes the case against a physician charged with causing such an injury very bad."

He also shows that these burns are produced from all kinds of apparatus, but that the static machine is generally believed to be less dangerous by experts, and he therefore concludes it is less valuable for therapeutic purposes. This latter assumption recent investigation does not confirm in the treatment of cancers.

He truly says that "from the consideration" of the facts derived from reported cases, "it is evident that we need some standard of comparison which will represent the total of ex-

posure in a given case, expressing both time and distance," but two of the factors, however, important as they are and therefore only relative. He suggests that "in general we may say that the danger, like the intensity, of the X-ray varies as the time, and inversely as the square of the distance. The writer appends a table of reported cases, giving with each, distance, time, days of incubation, severity, and comparative time at one inch. The figures show a range of difference which signifies to the experienced radiographer that the other factors, apparatus, quality of currents, and quality of tubes, as well as a most important factor, idiosyncrasy, enter so largely into results that no law of time and distance can be relied upon to the exclusion of the other features. In fact, if a correct law was formulated so many other conditions must be taken into effect that its value would be insignificant. The individuality of tubes and patients is so variable that it will even require the operator's constant care and the study of each case, especially when many exposures are to be made, as in therapeutic administrations is imperative. Effort to the contrary, to establish set rules of action, in the experience of many observers in the treatment of malignant disease, in virulent and deep-seated cases, in which the effect must often be carried to the limit, has shown a most variable tolerance to varying conditions. The bibliography, with the record of so large a number of cases, is a most valuable contribution to the literature of the subject.

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*Tumor of the Brain Localized Clinically by the Roentgen Rays, with some Observations and Investigations Relating to the Use of the Roentgen Rays in the Diagnosis of Lesions of the Brain.* By Drs. Mills and G. E. Pfahler, in the Philadelphia Medical Journal of February 8, 1902.

The case reported is one of a highly vascular gliomatous tumor of the brain. The accompanying radiographs, taken during the life of the patient, show the presence of a dense object in the location of the tumor.

The exposure was made by Dr. Pfahler. The anode was located opposite the supposed site of the tumor, at a distance of eighteen inches from the sensitized plate for  $3\frac{1}{2}$  minutes.

[The character of a tumor and thickness of the skull will always be factors to be considered, and will each time determine the result. Exostoses, highly vascular tissue, aneurisms, pus cavities, and foreign bodies may be shown as in other parts of body if the skull be thin, but rarely will it be possible to demonstrate a tumor of the brain under any but extremely favorable conditions as this case seems to have been.—ED.]

## ON REDUCTION OF THE VACUUM OF CROOK TUBES THAT HAVE BECOME "TOO HIGH FROM USE."

CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN, CONN.

One of the prominent difficulties to be overcome in using X-light for therapeutical purposes from high-vacuum tubes is the "raising of the vacuum" of the tube beyond a manageable point, from the continuous excitation necessary. This is due, of course, to the effect of the continuous passage of electrical current, for comparatively long periods, upon the arrangement of the ethereal atoms inside the tube, whereby it becomes impossible for the current to excite the peculiar vibrations which constitute X-light.

There are several ways of managing the situation, among which are the following:

First, the placing of a quantity of some chemical substance in a convenient portion of the tube, which will generate a small quantity of some gas, usually hydrogen, to be diffused into the vacuum, when an electric spark is passed through it.

Second, running the current through the tube with normal polarities reversed for fifteen or twenty minutes.

Third, laying the tube aside, and letting it rest for two or three months.

Fourth, re-exhausting the tube.

Fifth, baking the tube.

The disadvantage contingent upon the first-mentioned procedure is that the chemical will be effective for only a limited time, and the tube must then be sent to the maker for re-exhaustion. The second is by no means uniformly successful, and when it is the result is of very short duration. The third involves having tubes idle for long periods, and the vacuum runs up very rapidly thereafter. Re-exhaustion entails considerable expense, and as a rule a re-exhausted tube does not reach its former degree of efficiency. Baking is not expensive, does not entail the loss of much time, and has given me complete satisfaction as a remedy for this condition. It is done as follows:

A hot-air oven with a high-temperature thermometer registering the degree of heat attained is necessary, and I have found from 350° F. to 400° F. to be the most efficient temperature for this purpose. A tube that has never been baked will usually regain its susceptibility to excitation with two hours of this treatment, but sometimes, and frequently after repeated bakings, the time will have to be prolonged to five and in some cases to ten hours.

It sometimes happens that a tube is baked too long, when the current is run through no X-rays are produced,

violet brush discharge between the terminals indicating too low a vacuum appears. This can be overcome by running the current through the tube with normal polarity connections for fifteen or thirty minutes with one or two spark-gaps in the circuit. It will be observed after a little, that X-rays are appearing, and soon the tube will regain its normal efficiency.

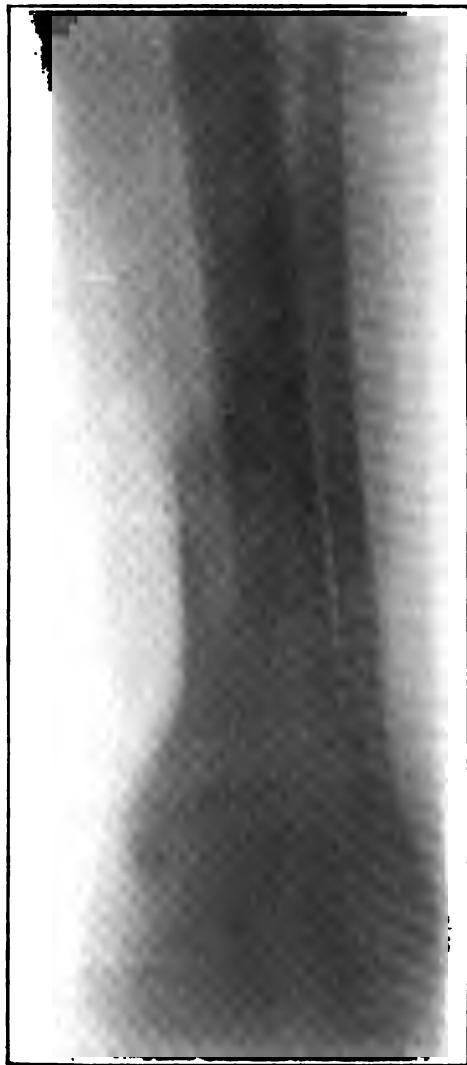
Repeated bakings do not seem to injure the tube, and the efficiency of the procedure has not seemed, in the writer's experience, to be vitiated by repetition. One of the best tubes I ever had has been treated in this way fifteen times during the last ten months, and it is still my favorite tube for treating cancers. As far as I am able to judge, it is also just as good for skiagraphy and fluoroscopy as it ever was.

A ready method of reducing tube vacuum is particularly valuable where a coil is used as the exciting agent, because, according to the writer's experience, a coil will put a tube out of commission by raising its vacuum beyond control, about twice as rapidly as a static machine. This is probably due to the greater amperage of the coil as compared with the static current. The greater amperage of the coil current probably also explains the greater volume of rays obtainable with this apparatus, and it is probable, further, that the greater volume of rays is responsible for the well-known increased liability to dermatitis when a coil is used.

As a rule it will be found necessary to bake a tube longer than has been used on a coil than when it has been put out of commission by a static machine, but the measure is just as effective eventually in one as the other. It should be remembered that a tube supplied with a chemical for regulating the vacuum should never be baked. Here there is no remedy but re-exhaustion, rest, or running the tube with the normal polarities reversed, and re-exhaustion, with a renewal of the chemical, is the only measure which gives much satisfaction with these tubes.

The accompanying radiographs were forwarded by Dr. M. F. Wheatland of Newport, R. I.

Mr. A. C. Y., volunteer fireman, while sliding down the pole in the engine room, lost control and landed heavily on right foot, fracturing tibia obliquely at its lower third; weight of body forced upper fragments and fibula down (external malleolus lower than normal). There was great swelling of the foot and leg which prevented the necessary extension being made to keep fragments in apposition. Patient was brought to me to be radiographed six weeks after the injury. The radiograph, when viewed antero-posteriorly, shows the lower fragment of tibia projecting upward and a space between it and the upper fragment, giving the impression of a third bone in the leg. Viewed laterally, the condition does not seem very abnormal, showing the necessity of taking an injured bone from more than one standpoint.



Tube, Swett & Lewis Co., two-inch spark resistance. Distance between cathode cup and anode plate, four inches. Exciter, Van Houten & Broeck Static Machine. Distance of plate from anode, eighteen inches. Time of exposure, twelve minutes. Plate, Carbutts' X-Ray. Developer, Metol Hydro.



Tube, Swett & Lewis Co., two-inch spark resistance. Distance between cathode cup and anode plate, four inches. Exciter, Van Houten & Ten Broeck Static Machine. Distance of plate from anode, eighteen inches. Time of exposure, twelve minutes. Plate, Carbutts' X-Ray. Developer, Metol-Hydro.

**RADIOTHERAPY.**

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

**A CASE OF LUPUS VULGARIS TREATED WITH  
THE X-RAY.**

BY DR. J. W. KING, BRADFORD, PA.

A gentleman of Cyclone, Pa., consulted me last November for an opinion in regard to an ulceration on the lateral border of the right side of the nose.



He was fifty-four years of age, well nourished, and otherwise enjoyed excellent health. His trouble was first noticed three years ago. "It came in the shape of a grain of shot under the skin—later it resembled a pimple."

The diagnosis of lupus was readily made. The crust was thin and brownish, and the ulcer superficial. The border of lupus was not sharply defined. The secretion was scanty and inodorous, and the scar was hard, shrunken, distorted, and yellowish-white. There was no pain to speak of, and the ulceration was strictly confined to one-half of the patch.



Treatment.—November 10, 1901. The patient's face was covered with a thick layer of tin-foil, and an opening made over the site of the scab. He was brought within twelve inches of a "low" tube, operated by a Waite & Bartlett, twelve-plate, thirty-inch static machine. The duration of the treatment was ten minutes.

Daily treatments for a week gave no noted improvement. At the end of another week thirty-minute treatments were given, the tube being twelve inches distant.

The tube was now brought a little nearer,—six inches,—allowed to run thirty minutes. On the following day an intense lacrymation of right eye was evident, as well as a dermatitis over the entire right side of the face. A boric-ointment was ordered and freely applied to the affected face. The eye trouble was also treated. In a week the dermatitis had completely disappeared.

Previous to this a great change had taken place in the ulcer, and on the following day the scab fell off, presenting a clean base and healthy granulations.

The tin-foil was laid aside and a thick sheet of lead—one-tenth of an inch—was substituted, the tube being six inches from the ulcer, and the time of exposure thirty minutes. After four or five treatments no further improvement was noted. The exposure was then prolonged to forty-five minutes, with some improvement again, which ceased, however, after the fourth treatment, when he was given an hour's exposure, with the result that in a few days the scab fell off, leaving a healthy surface behind.

After a week's rest, I was pleased to note that there was a complete cure.

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*The Therapeutic Value of the X-Rays in Certain Skin Diseases.* La Semaine Médicale, No. 2, 1902.

Two Swedish physicians, Drs. T. Sjögren and E. Sehlholm, have employed the Roentgen rays in 76 patients, with various skin affections. The séances, of ten to fifteen minutes duration, were given daily. The anticathode was placed from twelve to eighteen centimeters from the skin, and the intensity of the current in the primary circuit varied from 2 to  $2\frac{1}{2}$  peres. They came to the following conclusions:

The X-rays act but slowly upon the nodules of lupus vulgaris; hence it is of service to employ at the same time galvanic puncture. The results of such a mixed method were very satisfactory; for out of 27 cases they were able to obtain 18 definite cures. Some of these patients have since remained well for fifteen to sixteen months; in only 2 cases were there no results at all. There was the greatest variation in the number of sittings required, varying from a few to 200 or even more. The writers think Finsen's method to be superior to the X-ray.

Lupus erythematosus appears to be but little affected by this method; they observed 6 cases. On the contrary, tubercles, of which 5 cases were treated, yielded excellent results. A number, 11, of cases of chronic eczema, were cured.

after an average of 15 sittings. As the disappearance of the itching was one of the factors in the rapid success of the treatment these rays were successfully tried in 4 women with anovulvar pruritus. In 2 cases of psoriasis there was a complete failure. In acne and certain cases of ill-defined ulcers, possibly tuberculous in nature, there was either an improvement or a cure. As to hypertrichosis the epilatory action of the rays was easily foreseen but recurrences were frequent, and at times it seemed as if the hairs which grew again were more numerous and vigorous than those first treated. The treatment continued caused these to fall, and it is possible that long-continued treatment may bring about success. Finally, 5 patients with rodent ulcer or epithelioma of the face were all cured, and though a recurrence is to be feared the same treatment could be instituted again.

F. H. P.

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*Various Forms of Treatment for Lupus Vulgaris.*

Darbois (*Journal des Practiciens*, August 31, 1901) reviews the different modes of treating lupus vulgaris. The hygienic treatment consists in fresh air and superalimentation and at the same time the administration of cod-liver oil, creosote, arsenic, or iodide of iron. Local treatment comprises methods which effect a radical cure, and palliative measures. Among the first are mentioned cauterization with a hot iron, which is brutal and leaves deep cicatrices; scarification by fire, which appears to give the best results; excision of the lupus nodules, followed by reunion by first intention, or by grafts, according to the extent of the lupus; this last method effects a rapid cure, but recurrences are frequent. The other measures most commonly employed are: Scarification, indicated especially in congestive and hypertrophic forms of lupus, in lupus of orifices, and in galloping lupus of the face; scraping, good only in lupus involving large areas of the trunk and of the extremities; puncture by means of the thermocautery, or better by the vanocautery, which gives very good results; cauterization by chemicals is useful as an adjuvant to other procedures. Finsen's method, which is based on the bacterial action of luminous rays and on their property of penetrating the skin, has many advantages; the cicatrices are good, no pain is caused by the treatment, and it is applicable to most cases, but is very expensive and requires much time. (Abstract from *American Medicine*.)

[The above is a very careful summary of the ordinary treatment of lupus vulgaris, but we hope our readers will remember the brush-discharge in this condition, negative insulation of patient with positive pole grounded, and soft maple wooden-point electrode brought as near the lupus as can be well borne by patient.

We will be glad to have a report of all cases, success or failure.—J. D. G.]

**CONSTITUTIONAL DISEASES.**

EDITED BY FRANCIS B. BISHOP, M. D., WASHINGTON, D. C.

*The Harmful Effect of Static Electric Sparks in Convulsive Neuroses.* La Semaine Médicale, No. 54, 1902.

Dr. Vernay, of Vienne, France, having had occasion to treat a case of paramyoclonus multiplex in a young girl of twenty-three years, observed that the application of the breeze to the face and head brought about a decrease both in intensity and frequency of the convulsive movements. Three such treatments had caused these movements wholly to disappear when he unfortunately gave several sparks, which caused the disease to reappear with as great intensity as before. He repeated this experience four times, in order to convince himself. He has observed similar results in five children affected with chorea. After three or four sittings, when sparks were administered the children became so much worse that the parents ceased coming with their children for treatment. This failure is the more striking, for if static electricity be employed in the other forms it produces excellent results. Thus he has treated a number of patients with Sydenham's chorea and brought about a cure where the breeze was given daily, for eighteen days to a month. Therefore, he concludes that if one would treat convulsive neuroses by static electricity one should employ a sedative method as the breeze. Sparks seem to be more harmful than useful.

F. H. P.

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*Electricity in the Treatment of Anterior Poliomyelitis.*

The popular notion that electricity should not be used during the acute stage of anterior poliomyelitis does not apply to currents of great potential and small quantity. On the contrary, it has been demonstrated beyond question that such currents check acute inflammatory processes. In this particular affection, it has been shown that the pressure upon the ganglion cells is promptly relieved by the uniform recovery of the patient's power to move and use the paralyzed muscles, when treated before destruction of the cells has taken place. Vigorous application of the static wave current over the affected region of the cord at the onset of the symptoms of paralysis, or at the earliest opportunity, will be followed by complete or partial recovery in proportion to the promptness and thoroughness of the administration.

When it is understood that the measure is effective, and that the administration can be made without the slightest danger or discomfort to the youngest child, it seems that there can be no objection to its use; on the contrary, the

general adoption of the method should be urged upon the profession.—[EDITOR.]  
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## LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

BY W. S. SCHEPPEGRELL, M. D., NEW ORLEANS, LA.

### *Electrical Treatment of Aural Vertigo.*

Ear-vertigo as a symptom of chronic catarrhal inflammation of the middle ear is rare in some cases, while in others it is of so frequent occurrence as to practically disable the patient from his daily occupation. Medicinal treatment is usually unsatisfactory, and the scientific treatment refers to the removal of the cause, as, for instance, the freeing of the impacted stapes in the oval window of the tympanic cavity, the most usual cause of this distressing symptom.

In cases in which the treatment of the disease which causes the vertigo is unavailing, in which an operation is refused or contra-indicated, or when these have been unavailing in preventing the vertigo, electricity is a useful agent which has been successful in a number of cases. Various methods of application have been suggested, each of which may be given a trial in obstinate cases.

Good results for vibratory massage induced by an electric motor have been obtained by Gautier and Larat (*Revue Int. de l'Electrothérapie*, Paris). A helmet, somewhat resembling the form employed to take the shape of the head by hatters, is applied to the head of the patient, and the many arms of which it is composed are made to vibrate by means of a small electric motor on the top of the apparatus. They report a number of cases where the vertigo rapidly disappeared after the commencement of the treatment, the cure remaining permanent.

Static electricity may be employed either by means of the electric brush applied to the region of the ear, the patient being mounted on the insulating stool, or by means of a special electric application directly into the auricular canal. In either case, the negative discharge should be applied to the ear. In the latter method, only light applications should be made, as the acoustic nerve is extremely susceptible to electric excitation.

Galvanism in ear-vertigo has had the largest number of supporters, reports of successful cases being of frequent occurrence. In this method a mild current should be used, not only on account of the excitability of the acoustic nerve, but also on account of the local irritation that may be set up by the aural electrode.

In this connection the following points will be of interest (Scheppegrell, "Electricity in Diseases of the Nose, Throat,

and Ear," p. 319) : "It is of special importance, in stimulating the auditory nerve, that the dispersing electrode be placed at a distant point, as, for instance, the hand; the principal factor being a sufficient distance without relation to the antero-posterior diameter of the head.

" If the dispersing electrode be applied to the mastoid or other neighboring region, the tendency of the current is to reach the opposite electrode through the tissues by the most direct route. Therefore a greater portion of the current passes through the external tissues and very little to the auditory nerve. By applying the dispersing electrode to the hand or other distant region, a much greater portion of the current reaches the auditory nerve.

" In spite of every precaution, galvanization of the ear is sometimes followed by flashes of light, due to excitation of the optic nerve, cough, gustatory sensations, etc. A delicate rheostat and a mild current minimize these effects, but do not always prevent them."

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

The Chicago Medical Recorder for December, 1901, contains an article entitled "Superheated Dry Air in the Treatment of Acute Localized Infection and Septic Diseases; including Pneumonia, Pleuritis, Appendicitis, Osteomyelitis; with Report of Cases," by H. J. Burwash of Chicago. The paper had been read before the Chicago Medical Society on November 20, 1901.

The writer reports three cases of acute pneumonia, one of acute plastic pleuritis (mentioning several others), three of acute appendicitis, and two of acute osteomyelitis occurring in the course of typhoid fever, which he treated with local applications of dry hot air, and all of which recovered satisfactorily and much quicker and better than is usual under other methods of treatment. His experience accords in the main with that of other competent observers in this field. These cases of appendicitis and osteomyelitis are, as far as we know, the first of the kind to be reported as having been treated with this agent. Dr. Burwash has been anticipated in his use of hot air in pneumonia and pleurisy by others, however. He also mentions having treated acute and chronic synovitis and acute catarrh of the bile-ducts with beneficial results.

In reference to pneumonia he says, "Usually, when the physician is called to a case of pneumonia, the disease has already progressed from the first to the second stage. Consolation has taken place. Instead of waiting nature's methods or

giving the patient anti-pyretic drugs, we apply the hot-air treatment to the affected side. The immediate effect is to produce stimulation of the superficial cutaneous nerves; the capillaries and lymphatic vessels become distended, and the secretion and excretion of the enormous number of sweat glands which are instantly put into activity causes large quantities of sweat, the evaporation of which takes place as soon as it has reached the surface; this process extends to the deeper tissues, and thus is established a current loaded with micro-organisms from the diseased lung to the surface of the skin. The deep vessels relieved, the contents of the distended air cells are soon absorbed, and air is allowed to re-enter the once plugged air vesicles. With the destruction of the micro-organisms the toxæmia is arrested and at once reflected by the symptoms. The patient takes deeper respirations, the pain is relieved, the pulse increases in volume, the temperature, at first higher, soon begins to fall from  $1^{\circ}$  to  $2^{\circ}$ , the dyspncea is relieved, and the anxious expression of the face disappears. In fact, a crisis is created. The disease can be aborted."

Our experience clinically concurs in the main with that of Dr. Burwash, as noted above, except in that we have never seen a true crisis inaugurated by the application of this agent, and we have never seen a case actually aborted. We do not accept his conclusion that the current of fluids towards the surface, established by the treatment, carries with it enough pneumococci from the lungs to modify in the least the course of the disease. Indeed, we question very earnestly whether any at all are thus influenced. It is certain, however, that a good deal of toxin elimination is thus effected.

The true explanation of the beneficial action of local hot-air treatments in pneumonia is probably as follows: The primary pathology of the disease is constituted by the presence of cultures of pneumococci in the pulmonary alveoli, the culture medium consisting of exuded fibrin, which produces the consolidation by filling up the air-cells. To absorption of toxins from these cultures is due the systemic disturbance. Now the pneumococcus is the most sensitive of all known germs to changes in the temperature and other conditions pervading its pabulum; exceedingly slight departures from the conditions most favorable to its development being sufficient to entirely inhibit it.

When consolidation has occurred, the area affected has become practically a solid tissue continuous with the external skin, the layers of the pleuræ being in apposition and sometimes even agglutinated by fibrinous exudate, except in those cases where the consolidation is central with a layer of functioning air cells surrounding it. This condition facilitates conduction of heat applied at the surface to such a degree that it becomes possible to raise the temperature of the con-

solidation, not very much of course, but enough to impede the development of the pneumococci contained therein; consequently, the nerve centers being relieved from the toxic emanating therefrom, the patient's general condition improves immediately. The perspiration induced still further reduces the general toxæmia, and the stimulation of the absorption vessels results in removal of the exudate; the lung rapidly clears.

In the cases reported by Dr. Burwash it took from three to ten days for the physical signs of consolidation to appear. In the cases which we have treated the time has exceeded five days, and sometimes this result has been secured in forty-eight hours. In our experience lysis has been immediately brought about by the proper application of dry heat in seventy-five per cent of cases, but we have yet to meet a true crisis precipitated.

In reference to acute plastic pleurisy he says, "I have treated several cases of acute plastic pleurisy by this method and in no case did it take more than five treatments to bring about a perfect cure with complete absorption of the plastic matter and normal respiratory murmur restored. In two cases a temperature of 101°, and so much pain that respiration was exceedingly difficult, two treatments gave complete relief."

Of appendicitis Dr. Burwash says, "My success in the treatment of acute inflammations in other organs led me to believe that in the acute inflammations of the appendix very similar results would also be accompanied by the use of this potent method. As the micro-organism which causes inflammation in the appendix varies, so do the symptoms and pathological conditions vary.

"By the superheated, dry-air method mild cases are cured and prevented from terminating in abscess. In the fulminating cases the micro-organisms are so debilitated that the toxic products resulting from them is arrested, and the condition of the patient is so improved from the destruction of the bacilli that the operation, when it is done, is robbed of its terror."

In view of the ever-present difficulty, if not impossibility, of differentiating clinically those cases of appendicitis which are due to impaction of a foreign body from those which are caused purely by germ infection, we should not feel justified in abandoning early operation for the treatment by dry heat. If all cases were of the latter aetiological type hot air applications would undoubtedly prove curative in the majority of instances, but it could not, and should not, be relied upon in the former. We agree with the writer, however, that hot air is effective in limiting the inflammatory process, and would always recommend its application while waiting for operation, and when the patient is sufficiently

vised to refuse operation. The repair of wounds and abscess cavities is always greatly hastened by this agent.

His experience in osteomyelitis has led him to conclude as follows: "In the early treatment, before suppuration is evident, we have, I believe, in the hot air an aid which no other has so far accomplished. The heat, applied at temperatures ranging from  $250^{\circ}$  to  $400^{\circ}$  F., locally has produced a most remarkably soothing effect. The high temperatures appear to arrest the progress of the disease in its incipiency. The diffusion of the joints is quickly absorbed—an active osmosis established. Leucocytosis is probably increased. The micro-organisms may be destroyed, or at least seriously debilitated so that further injury from them is arrested."

"The hot-air treatment does not interfere with an operation if suppuration develops, while it may be the means of completely arresting the disease in the first stage, and thus obviate the necessity of an operation."

Dr. Burwash has presumably not used the body hot-air apparatus since he does not mention it, hence is probably not conversant with the striking effect obtainable in infectious conditions through the hyperleucocytosis, reflex stimulation of metabolism through the spinal centers, and extensive toxin elimination dependent upon the use of this measure.

The clinical results reported in the paper are valuable and instructive.

The Medical Brief for November, 1901, contains a very interesting and instructive article by Walsh of Edinburgh, Scotland, entitled "Some Observations on Gout and Goutiness." He discusses the clinical phenomena, symptomatology, and diagnosis, and under treatment says, "As a matter of fact, the treatment of gout by drugs stands very much as it did in the days of Sydenham. Colchicum, blue pill, and Epsom salts, with plain diet, rest, and local anodyne applications, remain the classical remedies for a 'fit of the gout.' The two main additions to the resources of modern therapeutics are sodium salicylate and iodide of potassium, which, together with guaiacum, exercise a powerful influence over gout. The explanation appears to be that all these drugs increase in some way or other the excretion of uric acid by the kidneys."

Large quantities of water internally are esteemed beneficial, as are also Turkish baths. These, and all exclusively drug treatments, however, only temporarily relieve the condition in the vast majority of cases, and do not cure the disease.

"The therapeutics of gout, however, have made a solid practical advance in the shape of the Tallerman superheated air treatment, invented in England some years ago. As most practitioners know, one part of the patient's body, say an arm or a leg, is subjected to a temperature ranging between  $200^{\circ}$  and  $300^{\circ}$  F. for half an hour or an hour. The effect of the

local application is upon the body generally, as shown by the copious sweating that ensues, and the fact that the kidneys excrete an increased amount of uric acid. The present writer has witnessed remarkable results following the application of the superheated air in gouty cases. It will control even acute gout, and in one case an incipient attack in the great toe was treated with so much success that the patient, a stockbroker, was enabled to keep his engagement at a shooting party next day. That result will speak volumes to all who are familiar with acute gout. In advanced and chronic cases the restoration of movement and return to health has often been of a most striking nature. Under the superheated air uratic deposits and enlarged bursæ often vanish.

"A somewhat extensive experience has convinced the present writer that the Tallerman method yields curative results in gout that cannot be approached by other therapeutic measures."

Anti-gouty remedies are recommended to be given in conjunction with hot air.

In reference to diet butcher's meat is not absolutely interdicted, but may be given in small quantities. Malt liquors, sweet wines, and liqueurs should be avoided, but small quantities of well-matured whisky or Holland gin are allowable. Open-air exercise is necessary.

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### CLINICAL MICROSCOPY AND BACTERIOLOGY.

EDITED BY ARCHIBALD M'NEIL, M. D., NEW HAVEN, CONN.

**I**N procuring material for bacteriological examination great care should be taken to guard against outside contamination, and everything used should be sterile.

In swabbing a throat for a diphtheria culture the sterilized cotton swab should never be touched by the fingers, and should not be allowed to come in contact with saliva or the tongue of the patient. The mouth contains numerous bacteria that grow with great rapidity, and if the swab is contaminated with them they may seriously affect the growth of the Klebs-Loeffler bacillus and the diagnostic value of the examination. Another thing which seriously affects the accuracy of examinations for the Klebs-Loeffler bacillus is the careless way in which some physicians take swabbings from a throat that has recently been sprayed with peroxide of hydrogen or some other antiseptic. This often results in a failure to obtain a

culture, or the growth of the germs may be so inhibited as to make the result of the examination practically worthless for diagnostic purposes, when it is finally obtained.

Sputum should always be collected in clean wide-mouthed bottles. The first raised by the patient in the morning is the best for diagnostic purposes. Bottles should be tightly corked and plainly labeled with names of both patient and physician, before sending them to the laboratory. This will save much confusion and trouble, and will insure a prompt report on the result of an examination.

Specimens of blood from suspected cases of typhoid fever, to which the Widal test is to be applied, should be collected on a clean (or better still a sterile) glass slide. The lobe of the ear, or tip of a finger, is thoroughly cleansed and then pricked with a sterile needle, and two or three drops of blood are collected on the glass slide and allowed to dry at the temperature of the room, after which the slide is put in a specially prepared container, or wrapped in aseptic cotton and sent to the laboratory. Some physicians prefer using serum from blisters, and collecting it in capillary tubes, and sending it to the laboratory in that form; but while this method is more scientific than the dried-blood method, it is not as convenient or practical for the average physician, and has little or no advantage from a diagnostic standpoint.

Physicians have been told that a glazed card may be used in place of the glass slide when it is not convenient or possible to obtain a slide, and it is true that it will answer very well; but when prescription blanks, writing, and wrapping papers are used, the accuracy of the examination may be seriously affected, especially if the microscopist has had but little experience with the Widal reaction. It is a matter of too frequent occurrence to receive a mass of dried blood on a slide with a request to examine for the plasmodium of malaria and for typhoid. Of course, as far as the examination for typhoid goes, that is all right, but to examine for plasmodia, either the examination must be made at the bedside with freshly drawn blood, or the thinnest possible layer of blood must be dried on a slide at the temperature of the room. A specimen prepared in this way can be stained so as to show plasmodia, if present.

The above facts may seem too simple and well known to

warrant their publication, but experience has taught us that, if the majority of physicians are familiar with them, they still need to have their memory refreshed when they are procuring material for bacteriological examination.

A. McN.

*The Value of the Eosinophile Count in the Differential Diagnosis of Human Blood.* By Orrin S. Wightman, B. A., M. D., New York, from the N. Y. Med. Journal for March 1, 1902.

About one year ago my attention was called to a statement in one of the medical journals that "human blood could be differentiated from the blood of animals by the relatively high percentage of eosinophile cells present in human blood."

For the purpose of carrying out the test, Dr. Huddleston kindly secured a large number of blood smears obtained from animals apparently in a healthy condition, and, after fixing with heat, stained them with Ehrlich's triacid stain. These smears included specimens from the horse, goat, white rat, sheep, gray rabbit, calf, pigeon, which latter, being a nucleated corpuscle, of course required no differentiation.

We are led to believe that the home of the eosinophile cell is in the bone, marrow, and glands, and that its appearance in normal circulating blood is almost a coincidence, or, as Cabot says, "a mistake."

Cabot observes that the eosinophile cell is the most actively amoeboid of all the corpuscles. Sherrington concurs in this, but adds that it is not phagocytic. This latter statement may explain why eosinophiles are generally increased in conditions of general inflammation or malnutrition, and not in acute trauma, where other members of the white-cell group are markedly increased.

The normal percentage of eosinophile cells in healthy human blood varies from one-quarter to four per cent. According to Cabot, among those conditions causing an increase in the number might be mentioned under general headings:

1. Diseases of the bone involving the medullary structures.
2. Diseases of the skin.
3. Diseases involving the genito-urinary system.
4. Certain parasitic conditions of the intestines.
5. Malignant tumors.
6. In post-febrile conditions after pneumonia, articular rheumatism, and malaria.
7. Asthma, of which they are a constant accompaniment.
8. The use of certain drugs, such as camphor, antipyrine, etc., in connection with which they are usually present.

The possible causes of an eosinophilia are so varied that its presence in human blood might very easily be explained in

spite of the low percentage normally present; but even eliminating every ordinary causal factor, in a healthy adult we still have the normal percentage of from one-quarter to four per cent.

Turning now to a comparative study of animal blood we find the same classification of white cells holds good, viz., large and small lymphocytes, polymorphonuclear cells, eosinophile cells, eosinophilic myelocytes, etc. With the same cell structure and an identical cell composition we are justified in believing that the physical status of animals would bear a distinct relation to the proportion of the kind of white cells present. In other words, it offers a parallelism to human blood as to cause and effect, and would show a difference in eosinophile count according to the status of the animal at the time the specimen was taken.

In the following subjects used (horse, white rat, pigeon, gray rabbit, calf, and goat), the animals were presumably healthy, all eating and drinking as usual, and showing no evidence of disease. Five hundred cells were chosen as a basis for counting lymphocytes (large and small), polymorphonuclear cells, and eosinophiles.

As a whole the blood of the animals showed a high lymphocyte count, a small polymorphonuclear count, and an eosinophile count averaging 3.82 per cent. The eosinophiles fall nicely within the normal human count, and could in no wise be distinguished from them.

From my examinations of a few specimens of human blood taken from patients suffering with well-marked symptoms of disease, a case of leprosy showed 6 per cent. eosinophiles; one of pityriasis rubra, 1 per cent.; one of psoriasis, 3 per cent.; one of dermatitis herpetiformis, 5 per cent.; one of lupus, 3 per cent.; one of dermatitis exfoliativa, 4 per cent.; one of chronic Bright's, 1 per cent.; one of phthisis (second stage), 2 per cent.; one of syphilis, 1.5 per cent.; and one of chronic asthma, 3.5 per cent.

In the conditions mentioned it is usual to obtain a much higher percentage. Summing up, then, I think we are justified in concluding:

1. That, in this series examined, eosinophilia may occur in higher percentage in animal's blood than in human blood.
2. That the physical condition of the animal whose blood is to be compared may play an important part in the increase or decrease of eosinophiles present.
3. That in the specimens examined the polymorphonuclear counts were low and the lymphocytes high, exactly contrary to conditions present in normal human blood.
4. That the eosinophile count is not a constant or trustworthy factor in diagnosis, but, on the other hand, is very unreliable and unsatisfactory; and, finally,
5. As a comparative test the eosinophile count is a negative quantity.

## DIETETICS.

*Diet in Obesity.* Copyright.

Drink one or two glasses of hot water on rising. Water may be flavored with lemon juice, weak tea, or aromatic spirits of ammonia (a teaspoonful to a glass). Hot skimmed milk may be substituted for hot water, adding six grains salt and six of soda to each glass.

**Breakfast: Cereals.**—Cooked gluten (thirty per cent.), or glutens with salt, meat or prune juice, or with a little butter cream; rice with skimmed milk; shredded wheat.

**Meats (Red).**—Round or rump steak, mutton chops, steak well done, scraped meat ball, served hot; pepper, chutney sauce, lemon juice, vinegar.

**Fish (fresh only).**—Cod, haddock, tunniers, chicken halibut, smelts, flounder, the lean of shad or bluefish; perch, pickerel, trout, or other lake or brook fish, baked or roasted.

**Eggs.**—Soft boiled or poached, twice a week. The whites may be eaten at any time.

**Breads.**—Gluten bread, gluten and bran bread, bran bread, rye bread toasted and redried; unsweetened rusks, zwieback, hoecake, crusts. Butter in moderation. Orange marmalade.

**Fruits.**—Raw, stewed, or roasted; ripe sour apples, oranges, sour grapes, orange juice, pineapple juice, peaches, berries, cherries, grapefruit, white grapes, gooseberries, acerola, melons, and unsweetened prunes.

**Drinks.**—Black coffee with lemon juice, clear weak black tea, skimmed milk, water; one glass of either or none.

**A. M., Between Meals.**—Two glasses of hot water, skimmed milk, buttermilk, lemonade, cider; a gluten biscuit, a few almonds.

**Lunch: Meats (Red).**—Roast mutton, lamb, or beef; sweetbreads. **Meats (white):** Stewed or roasted chicken, turkeys, squab, capon.

Any game bird except duck or goose. Mustard.

Any fish mentioned; shredded codfish, scrod.

Any vegetable mentioned; raw tomatoes with vinegar.

Any bread mentioned. French bread (dry), pilot bread, Bent's water crackers.

Any fruit mentioned.

Any drink mentioned.

Any dessert mentioned. Salted almonds, filberts, pecans with crackers or fruit.

**P. M., Between Meals.**—Weak tea with a rusk. Cider.

**Dinner: Soups (very little).**—St Julien, plain consomme, oyster or clam broth; chicken, veal, or lamb broth.

Any fish mentioned. Oysters, raw; Little Neck clams, stewed clams. Any meat mentioned.

**Vegetables.**—Asparagus, spinach, water cresses, young

onions, artichokes, oysterplant, mushrooms, Brussels sprouts, radishes, young peas, beans, lettuce, celery, tomatoes and white cabbage. One small baked potato, daily. Mustard.

Any fruit mentioned.

Any drink mentioned; claret, white wine, hock, still Moselle.

Desserts.—Coffee jelly, calf's-foot jelly, strained cranberry, tamarind or rhubarb sauce; cottage, buttermilk, or skimmed-milk cheese; Parmesan, Dutch, or Suffolk cheese.

9 p. m.—Two glasses of hot water.

Make an examination of the kidneys and heart before beginning an obesity diet. Unless hot water is taken avoid two mouthfuls of meat to one of anything else. "Water in excess is indicated in plethora, whether associated or not with glycosuria, gout, lithæmia, or rheumatism, if the heart and kidneys admit of its use. If water in excess tends to keep the patient fat on account of slow circulation in the capillaries and deposition in consequence, saline should be used to drain the system. In albuminuria, restricting the water is advantageous, as it is associated with cardio-vascular disturbance. Restriction of fluids is also indicated in dilatation and heart weakness, arteriosclerosis, especially in anæmic cases where there is a tendency to dropsy." Anæmic cases require iron.

"Restricting water with meals lessens the appetite; while water in quantity at meal time tends to fatten in some cases, by interfering with digestion, especially in dilatation of the stomach. When the use of water is restricted, the kidneys must be watched to see if the waste is still being eliminated. Two pints of water should be sufficient, no liquid being taken at meal time in case a dry diet is desired; or a cup of clear tea or coffee may be used night and morning, two glasses of wine and three of water in twenty-four hours, as a measure. Red meat should be eaten but once a day on a dry diet." Pare all fruit, and see that meat and fish are freed of connective tissue. If a stout person be afflicted with nervous exhaustion, allow "a reasonable amount of easily digested fat." If the heart be sound, more fat can be allowed. Mild starvation is advisable for a sedentary patient.

"When the urea and phosphates are below normal, increase the exercise; when above normal, the amount of water and exercise being what they should, diminish the nitrogenous food, as there is renal insufficiency." Hill climbing, seaside living, cold baths, and vapor baths are useful adjuncts. If fatty degeneration be present, restrict the amount of exercise, and use sweating baths.

For patients in bed a hot skimmed-milk diet, two ounces every two hours, may be used. Four to six ounces of starch and fat food together daily should be the limit. Sugar is very fattening.

Water starvation is sometimes efficient in the reduction of weight. Vegetables sometimes maintain weight, hence are called for when a big appetite has to be satisfied and there are no contraindications.

Patients with a tendency to gout, rheumatism, lithæmia, headaches, or neuralgia should let sugar and other sweets practically alone; they should not be allowed tea, coffee, viscera or red meat in excess, because they are uric-acid yielders; or tomatoes, spinach, rhubarb, sorrel, asparagus, and old onions, because they contain oxalate of lime.

Seven hours' sleep should be sufficient, and no sleep should be taken during the day.

Two teaspoonfuls of Carlsbad salts in hot water in the morning is admirable, particularly in plethoric cases, if the stomach be tolerant.

Medical gymnastics or massage are "frequently essential to the successful operation of this diet" which need not be followed strictly "after the weight and appetite are under control."

## SOCIETY MEETING.

### ELEVENTH ANNUAL MEETING OF AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

THIRD DAY—THURSDAY, SEPTEMBER 26, CONTINUED.

*Report of Committee on Roentgen Ray*—Dr. C. O. Files of Portland.—Discussion.

Dr. Charles O. Files of Portland, Me., presented the report of the Committee on Roentgen Ray, and then asked that in this connection Mr. T. B. Kinraide of Boston be asked to describe the coil that he had devised. Mr. Kinraide described his apparatus as desired.

Mr. T. B. Kinraide of Boston said: The coil I have succeeded in making was the result of the repeated breaking down of the Ruhmkorff coils ranging from six to eighteen or twenty inches. I have succeeded very well in removing from the apparatus the danger of destruction so common to the ordinary Ruhmkorff coil. The high-potential regions of the Ruhmkorff coil are very close to the primary (see Fig. 1), being only removed by the strength of the insulation between the outer sections carrying high potential (D and E), and the iron core of the primary. In my experiments the great difficulty met with was that the Ruhmkorff coil would break down, even through half-inch tubing covering the core. My object was to remove

\* Held at Buffalo, N. Y., September, 24, 25, and 26, 1901. Ernest Wende, M. D., of Buffalo, President.

the high-potential region of the coil as far as possible from the primary. In my coil this has been done, the low-potential

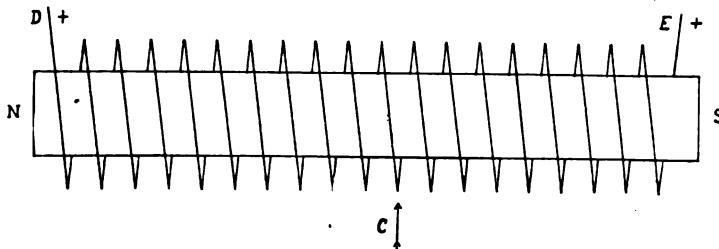


Fig. 1. D, and E, high-potential N. S. iron, are of the primary coil. C, low-potential region.

region of the single coil (G, Fig. 2) being the only part it could come in contact with. By a diagram on the blackboard showing the old cylindrical primary with its lines of force let me illustrate the action of these lines, and call attention to the fact that the moment the current is broken these lines of force

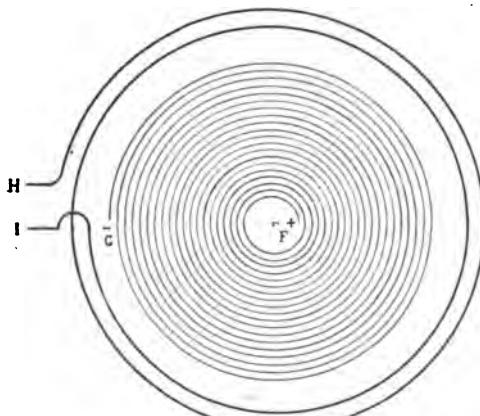
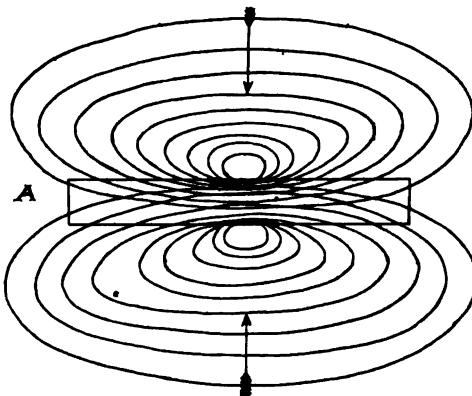


Fig. 2 Primary, low-potential region of high potential (H—I primary).

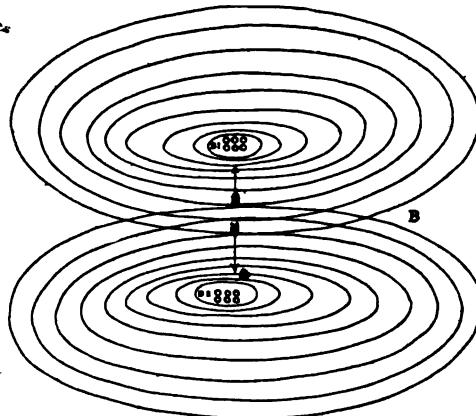
collapse and fall inward in the direction of the arrows (Fig. 3). In this way the highest potential is produced in the outer terminal of a thin flat spiral secondary, if located in the plane of the arrows, and the low potential at the center. By that method of winding, as the turns grow longer, the resistance per turn increases, and the tendency of the discharge to pass from one turn to the other increases. If a suitable primary were placed on the outside of this secondary, as in Fig. 2, the reverse would be the case, and hence the tendency to break down would be entirely removed in the section of the secondary. In

my coil this is the arrangement adopted, and the lines of force fall away from the center towards the primary in the direction of the arrows in Fig. 4, producing a very high potential



**Fig. 3.** Lines of force fall in the arrows in the older form of coil.

at the center (F, Fig. 2), and practically very little or no potential at the outer turns (G, Fig. 2), so that the center discharges in the proportion of about six inches towards the earth



**Fig. 4.** Shows the arrangement by which the lines of force fall away from the center towards the primary, as indicated by the arrows.

wire whilst the outer terminal discharges about three-fourths of an inch only. To remove all tendency of discharge towards the primary, two of these coils were placed side by side (see Fig. 5). The two primaries are so arranged that a high-poten-

tial positive and negative is obtained from the center terminals of the secondaries. There is practically no tendency whatever in this form of coil to break down. The primary is operated by a form of spark-gap, the efficiency of which is due to a low-potential current discharging across a very small air space, and

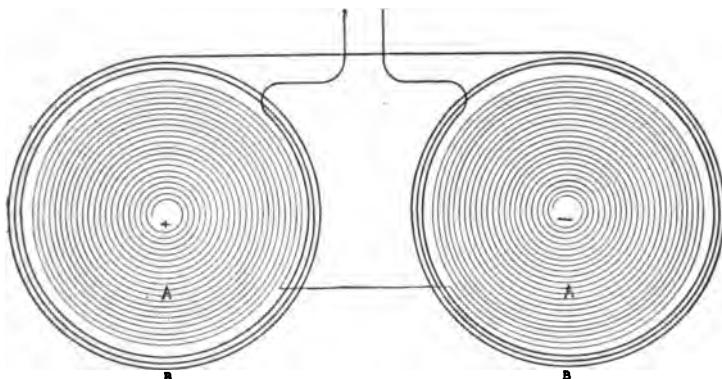


Fig. 5. Shows the arrangement of two coils side by side: A.A., secondary.  
B, B, primary.

producing erosion of copper plates, which interrupt the circuit in the primary. The condenser has about 900 volts and is discharged through both primary circuits, producing a great many interruptions per second in the circuit of the induction coil proper. In the device used for charging the condenser there is a rotary brake in the circuit, with a coil connected with the street main. At each interruption of the latter coil the induced current charges the condenser, and with each charge, instead of the condenser breaking down, there is a breakdown at the air gap. This air gap is regulated at will by means of a lever. The rotary brake makes about 2400 interruptions per minute, and with each interruption here there are from 20 to 25 interruptions in the primary circuit of the induction coils, thus giving about 48,000 interruptions per minute. It is largely due to this very high frequency that the time of exposure for photographic work is so greatly reduced. If two wires are placed in the upper portions of the coils, they discharge freely into the air. If the discharge terminals are so far apart that the discharge will not pass between them, it passes just as freely through the atmosphere as if the poles were in contact. This furnishes an additional safeguard. There is no heating whatever in the large copper wire forming the primary, whilst the heating of the primary of the Ruhmkorff coil in close contact with the insulating compound of the secondary is too well known to

comment upon. The secondary is imbedded in a solid insertion of rosin and beeswax. My remarks on the Ruhmkorff are not intended to be derogatory of that coil, for I think much of it, but I must necessarily make comparisons in order to show the distinguishing features of my apparatus. One excellent feature of the entire machine is that, if anything should happen to any part of it, it can be repaired at slight expense. The apparatus weighs only about seventy-five pounds, and therefore can be taken to hospital wards or to a patient's home. I do not know just what is the value of this apparatus in electro-therapeutic work, but I think there is a good field for it. The instrument, by special winding, can be adapted to any form of current.

Dr. R. J. Nunn said that Mr. Kinraide possessed remarkable fine photographs of sparks, and he would ask that Mr. Kinraide be requested to exhibit them at the next meeting of the



The Kinraide Coil.

Association. Dr. W. H. White heartily indorsed this suggestion as, he said, the work was exceptionally fine.

The president then formally invited Mr. Kinraide to exhibit these photographs at the next meeting of the Association.

Mr. Kinraide: When the apparatus is properly arranged there is produced from the center terminal a peculiar light violet discharge, coming out in thin streamers of such high potential that one can put the hands or the face in the path of the discharge and feel no shock. Along with this discharge a tremendous generation of ozone, or correctly speaking oxygen and nitrous acid.

Dr. W. J. Morton asked for further information as to the nature of the discharge from the secondary; whether it was snappy and sharp, or bluish.

Mr. Kinraide: The discharge can be varied very considerably by simply moving the spark-gap plates to a greater or less distance from each other. When close together the frequency of the discharge from the condenser is the greatest, and the result is a very hot and very severe current. When the

plates are farther apart the condenser discharges in such a way as to produce great frequency of vibration and almost painless discharge in the secondary. The low potential obtained by having the plates rather close together gives the best results in X-ray work.

Mr. R. G. Brown's article on "Organization of the Second International Congress of Electro-Therapeutists" was ordered read by title.

Dr. Newman, having learned of the complimentary action taken by the Association in regard to himself, asked the privilege of expressing at that time his sincere thanks for the resolution that the Association had passed expressive of its appreciation of his work.

Dr. Ernest Wende, in handing over the gavel to Dr. Frederic H. Morse, the president-elect, said: "My troubles are ended, and your troubles will now begin."

Dr. F. H. Morse: Dr. Newman assures me that he will try to live another year, and under those circumstances my work will be easy. I thank you for the honor conferred upon me, and assure you that I shall endeavor to do my best.

The following were announced as constituting the special committee on the nature of currents from static machines, Messrs. A. E. Kennelly and W. G. Jenks and Professor Samuel Sheldon of Brooklyn.

On motion of Dr. Reyburn, Dr. W. J. Morton was added to this committee.

On motion, the Association finally adjourned at 12.00 M.

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## NOTES AND COMMENTS.

### SECOND INTERNATIONAL CONGRESS FOR ELECTRICITY IN MEDICINE AND RADIOGRAPHY, BERNE, SEPTEMBER 1-6, 1902.

The first international Congress for electricity in medicine and radiography, which was held in Paris last year, was a complete success.

More than 150 scientists from all countries were assembled, and there ensued a lively exchange of ideas on the numerous subjects of interest in medical electricity.

At that time it was voted to hold an International Congress periodically every three years, but, to avoid clashing with other Congresses, it was resolved the Second Congress be held in 1902, and at Berne.

The following International Committee were then elected, and charged with the arranging of future Congresses: M. Tripier, Paris, president; E. Doumer, Lille, secretary; A. Moutier, Paris, assistant secretary; Boisseau du Rocher, treasurer;

Benedikt of Vienna, R. G. Brown of Brooklyn, N. Y.; Chatzky of Moscow, Dubois of Berne, Grunmach of Berlin, La Torre of Rome, Leduc of Nantes, Provost of Geneva, Schiff of Vienna, Weiss of Paris; W. Salomonson of Amsterdam.

The details of organization of this Second International Congress have been intrusted to a local committee of which Dr. Schnyder is secretary.

The Congress is under the patronage of Dr. Gobat, Counsellor of State, Director of Public Education; Von Steiger, Mayor of Berne; Professor Forster, Director of the Physical Institute; Professor Jadassohn, Director of the Dermatological Clinic; Professor Kocher, Director of the Surgical Clinic; Professor Kronecker, Director of the Physiological Institute; Professor Müller, Director of the Gynecological Clinic; Professor Pflüger, Director of the Ophthalmological Clinic; Professor Sahli, Director of the Medical Clinic.

The Congress will commence September 1, 1902, at the Physiological Institute. It will last six days.

Besides the communications made by members, papers will be read on the following general questions:

1. The Present State of Electrodiagnosis, by Dr. Cluzet (Toulouse), Dr. Mann (Breslau).
2. Surgical Electrolysis, by Dr. Guilloz (Nancy).
3. Radiography and Radioscopy of the Internal Organs, by Dr. Béclère (Paris), Professor Grunmach (Berlin).
4. Accidents Caused by X-rays, by Dr. Oudin (Paris).
5. The Danger of Industrial Electric Currents, by Dr. Battelli (Geneva).

The duration of each paper is limited to twenty minutes and to ten pages in print. The manuscript should be sent to the secretary before July 15, 1902.

An international exhibition of all electrical instruments of physiological, electro-therapeutic, and radiographical interest will be held in connection with this Congress.

To become a member of the Congress an application, together with a "carte de visite," should be sent before the opening of the Congress to the secretary, Dr. Schnyder, 38 rue Fédérale, Berne. At the same time a sum of twenty-five francs for the membership must be sent by post to the secretary, the receipt for which conveys the right of membership. The publications of the Congress are included in this entrance-fee.

Members who wish to make a communication are requested to notify the secretary. The duration of a verbal communication is limited to ten minutes. The report of a communication should not be more than five pages of print. If the manuscript is not handed in, only the title will be given. Members who take part in the discussion should also send to the secretary a précis of their speech.

**BOOK REVIEWS.**

**GENITO-URINARY DISEASES AND SYPHILIS.** For Students and Practitioners. By Henry H. Morton, M. D., Clinical Professor of Genito-Urinary Diseases in the Long Island College Hospital; Genito-Urinary Surgeon to the Long Island College and Kings County Hospitals and the Polhemus Memorial Clinic, etc. Illustrated with half-tones, and full-page color plates. Pages xii + 372. Size, 9 1/2 x 7 inches. Price, extra cloth, \$3. net, delivered. Philadelphia: F. A. Davis Company, Publishers, 1914 Cherry Street.

The writer's effort to present in a concise form the subject under consideration, has produced a work which will enable the general practitioner to recognize the various conditions as they arise, and to appreciate the possibilities, if not the details, of the different surgical procedures suggested. In a work of such scope it would not be possible to accomplish more.

Diagnosis is ably treated, and the cuts and plates illustrative of apparatus, conditions, and typical syphilitic eruptions, are of an excellent order.

The work will be appreciated by the busy practitioner.

**THE INTERNATIONAL MEDICAL ANNUAL.** A Year Book of Treatment, and Practitioner's Index. Compiled by the usual able corps of Editors for 1902. (Twentieth Year.) New York: E. B. Treat & Co., 241 and 243 West Twenty-third St.

This Annual has a place in the library of the physician, whereby from year to year it is possible to note medical progress, and from which he may derive many valuable suggestions. The price places it within the reach of all, and especially valuable is it to the man of small means, who cannot add the elaborate contributions to a year's progress.

A work of this kind can only be judiciously compiled by placing over the various departments those who, by special application, are best qualified. That the editors have been well chosen the excellent character of the work attests.

**THE DIAGNOSIS OF SURGICAL DISEASES.** By Dr. E. Albert, Late Director and Professor of the First Surgical Clinic at the University of Vienna. Authorized Translation from the Eighth Enlarged and Revised Edition by Robert T. Frank, A. M., M. D. With fifty-three illustrations in one large volume. Published by D. Appleton & Co., New York, 1902. Price, \$5.00 net.

The plan adopted by the author of this valuable work, of classifying diseases according to similarity of symptoms and points of general resemblance, makes it a most valuable aid in differential diagnosis. No work is of more value to the student and practitioner than the one on diagnosis, which clearly sets forth points of difference, and demonstrates correct methods of examination. In this particular the author of this work has been successful. The fact that seven editions have been already exhausted is sufficient evidence of the excellence of

its contents. The typography and general appearance of the work are excellent.

**DEFECTIVE SPEECH AND DEAFNESS.** By Lillie Eginton Warren. Pages 116. New York: Edgar S. Werner, Publisher, 108 E. Sixteenth St.

This little work, written by a laywoman, contains very much of interest to the physician, who necessarily comes in contact with these unfortunates.

The painstaking care of just such persons as the author has accomplished what the physician cannot. It is this knowledge which this book contains, which, through the advice of a physician, will contribute to the proper training and teaching which will make lives more useful.

**A SYSTEM OF PHYSIOLOGIC THERAPEUTICS.** A Practical Exposition of the Methods, Other than Drug-Giving, Useful in the Prevention of Disease and in the Treatment of the Sick. Edited by SOLOMON SOLIS COHEN, A. M., M. D., Professor of Medicine and Therapeutics in the Philadelphia Poly-clinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physician to the Philadelphia Hospital and to the Rush Hospital for Consumption, etc. In eleven octavo volumes. American, English, German and French Authors.

**VOLUME VI.—DIETOTHERAPY and FOOD IN HEALTH.** By NATHAN S. DAVIS, Jr., A. M., M.D., Professor of the Principles and Practice of Medicine in Northwestern University Medical School; Physician to Mercy Hospital and Wesley Hospital, Chicago; Member American Medical Association, etc. Published by P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, 1901. Price for the set complete, \$27.50 net.

“Dietetics.” Dietotherapy is a most valuable department of therapeutics—one which it is the purpose of this journal to assist in advancing. We welcome and cordially recommend this valuable contribution to the literature of the subject. Vol. vi., which, by coincidence, appears before its fellow, vol. v., treats in chapter ix. of Beverages—Tea, Coffee, Cocoa, and the Alcoholics,—in which the scientific reader will generally concur. Chapter x. to Diet in Health; xi. and xii., to Infant Feeding, and chapter xiii., to Food as a Cause of Disease.

Part ii. considers Special Diets in Disease; chapter i., to the General Principles of Feeding the Sick. The subsequent chapter carefully consider the matter of diet as indicated in every disease of any importance.

The subject of diet is of so much importance in treatment in all departments of the profession, medical and surgical, that few can afford not to be in possession of a work of this character.

The editor, author, and publisher are to be congratulated upon the excellent character of the work.

*The Journal of*

# Advanced Therapeutics

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## CERTAIN NEWER USES OF ELECTRICITY IN MEDICINE AND SURGERY.\*

BY G. BETTON MASSEY, M. D., PHILADELPHIA.

In thanking you for the compliment conveyed in the invitation to address the association, I wish to express full appreciation of the honor conferred upon me. To meet Southern medical men is indeed a pleasure to one who, if for only a brief period of a few months, was once one of them, and who still has many ties of kinship in a neighboring State, for, in spite of the happy political unity of our country, an agreeable sectionalism may be noted in the stimulating medical atmosphere of the Southern States, an atmosphere that has not only produced intellectual giants at home, but has contributed many of the best specimens of medical culture to Northern and Western cities. It is as an antidote, indeed, to the overzealous work of the followers of your own Marion Sims that much of my labors have tended, and, as it is an axiom in medicine that the remedy should reach the original site of the disease, it is but appropriate that the claims of conservatism in gynecology should be forcibly presented in Alabama.

Before advertiring to the newer conceptions of the part to be played by electricity in the field first occupied by your noble fellow-citizen, I wish to speak of the modern views of the mode of action of this remedy.

No longer confined to the neuro-muscular stimulation of the older neurologists, medical electricity has within the past ten years made advances that are at least commensurate with its wonderful progress in transportation and other commercial and industrial uses. Analyzing these medical advances, I may say that the chief factor has been the recognition of the power

\* An address delivered before the Alabama Medical Association at Birmingham, April 17, 1902.

of this agent to modify the chemical interchanges of the tissues themselves, rather than the nerves. For instance, the value of electric currents in gynecology is now known to be largely due to their action on the tissue cells—a stimulation of katabolism in the parenchyma of organs. This explains why the proper interval between galvanic applications to an enlarged uterus or inflamed appendages is important, permitting a proper anabolism or building-up effect to succeed the destructive chemistry forced upon them.

The field of electricity in gynecology is a most valuable one, because of the freedom with which we can thus set in motion these salutary trophic changes in congested, inflamed, or hypertrophied organs. The same work can be done elsewhere in the body, particularly in the skin, for instance, but is peculiarly valuable in the pelvic organs by reason of the frequency of degenerative processes in this situation, and of the fact that we can employ comparatively large currents in this region without pain.

With this key to our work, it is readily seen that the trained office practitioner can do much for the cure of most uterine, tubal, and ovarian affections, particularly when it is recalled that the great majority of the chronic affections of these organs are resultants of inflammatory processes. We are here, as office consultants and practitioners, called upon to combat the effects of microbic invasions rather than the microbic-phagocytic contest itself. It is as a stimulant of absorption, regeneration, and tone, that results are gained.

He who has this remedy in his armament will therefore approach the daily problems of the gynecologist with a different mental attitude from that now so unfortunately prevalent; his thought will be of reconstruction, not destruction, and his goal the restoration of function by restoring organs to their normal physiologic activities.

And let me pause here and point out the importance of the little ailments of women, those that trouble the poorly developed girl at every recurring period, as well as those that sap the cheerfulness, comfort, and vigor of the young wife and mother. The standard works of the surgical writers deal freely with dysmenorrhea, but what are the remedies offered? We are told to dilate the cervix, when it has been proven again and again that no true obstruction exists, that accumulation of

menstrual fluids never occurs in these cases, and that the seat of the morbid functionation is as often in the ovarian nerves as in a catarrhal uterus. The way to a lasting cure is by the chemical stimulation of the endometrium by galvanic currents in catarrhal cases, or by a stimulation of the whole pelvic circulation by vaginal applications in the ovarian cases. To cure these patients, moreover, is to save ovaries, for sooner or later they will otherwise be advised to resort to the operating table.

And now as to the little troubles that sap the cheerfulness, comfort, and vigor of the young wife and mother. We specialists do not see these cases at this stage. But little indeed is said of them in the books, so much space must be given to the great operations. Yet the happiness of the American family is largely dependent upon the ability of physicians to conduct a woman healthfully through her procreative life. For some reason or reasons, possibly corset-wearing, heavy under-clothing, la grippe, or bad sexual and general hygiene, the average woman does not come up to the standard of the Israelitish women in ancient Egypt. Subinvolution is the rule rather than the exception, and the young woman leads a miserable existence from one confinement to another. These women have a right to demand of us comfort and happiness, as well as mere life. The civilized law of monogamous marriage is sometimes at stake. In electricity we have the surest remedy for these abnormal conditions and their consequences, and it is most fortunate that the technical methods of application are the simplest in these cases. Mere vaginal faradic applications are useful even, since the conditions to be combated are largely vasomotor and muscular.

Greater skill is required in the successful treatment of chronic metritis, and particularly of inflammatory diseases of the appendages. Simple metritis, when treated by the galvanic current, becomes the most curable catarrhal affection of any portion of the body, while even chronic pus tubes may be caused to shrink and drain their contents through the uterus by skillful, long-continued treatment.

The electric treatment of fibroid tumors remains the method of choice if the tumor has not degenerated, if it is not excessively large and thus a mortifying deformity, and if the patient prefers a long and tedious treatment ending in a permanent shrinkage to one-half or one-quarter its size, with a possibility

of disappearance, rather than a dangerous operation that successful, leaves her unsexed and probably ruptured. I have large experience with the Apostoli treatment of fibroids, I recall but two or three failures to arrest the growth, due to flamed appendages, all other cases suitable to the treatment being rendered comfortable for life by an arrest and reduction of the growth. An unimportant lump of fibrous tissue remaining in the uterus generally, it is true, but it gave no further trouble and the woman continued in possession of her bodily organs. All hemorrhagic conditions were cured, and some tumors disappeared by absorption. In my opinion, every town and every country should have an expert devoted to this work.

All work in electro-gynecology requires time and good technique, but is none the less important, for it is our duty to bring our best efforts to the service of our patients, even though tedious to ourselves.

I now wish to allude briefly to that recent discovery of my own which is sufficiently quick in results to command attention from mere surgeons as well as physicians; I allude to the destruction of cancers and sterilization of the tissues surrounding them by mercuric cataphoresis.

In this process or operation electric currents of ample power are made to convert quicksilver, inserted within the cancer, into soluble oxychlorides, and diffuse the latter, not only throughout the infected area, but also far enough beyond it to sterilize the latent cells at some distance from the apparent limits of growth. These results are accomplished at one application if possible; the large current required usually necessitating that the patient be under a general anæsthetic for a period varying from fifteen minutes to three hours. While the current is flowing the growth turns grayish, softens, and loses vitality, the marked feature being the immediate disappearance of the brawny induration of malignancy. An inodorous, aseptic, painless slough is produced, coterminous with the growth, surrounded by a region of irritation, the slough coming away in fourteen to twenty-one days, leaving a healthy cavity to be filled by granulation. Aside from its bloodlessness and painless after-effects, the chief advantages of this method that insure freedom from recurrence are: all affected cells are killed, leaving none for reimplantation in cut edges; the region beyond the cancer proper is freed from cancer cells without destruc-

of healthy tissue; and the method may be used where the knife cannot reach the seat of disease. In applying it to fifty cases, usually exceedingly desperate instances of this terrible disease, I have met with thirty-two per cent. of cures, fifty-seven per cent. of temporary palliations, and a mortality of fourteen per cent. A most valuable future is predicted for this method when its full capacities are developed.

Finally, I should add that a minor variety of this procedure has been successfully applied to four cases of tubercular glands of the neck. In this application of mercuric cataphoresis to the sterilization of tubercular glands and abscesses, general anesthesia is unnecessary, an opening being made into the gland and a tiny gold tube coated with quicksilver inserted under the ordinary chloride of ethyl spray. Repeated applications of this method with very small currents result in complete sterilization of the affected area, and final closure of the wound with a scar no larger than a pin-head. The patients invariably recovered strength and health rapidly under these applications, which form a definite mode of curing tuberculosis in accessible portions of the body.

Of the possibilities of this method in the immediate cure of chancre and late syphilitic deposits, and in the immediate destruction of carbuncles, etc., I can only make a favorable prediction, not having had an opportunity to put it to this test.



## ETHER.

BY GEORGE ADAM, M. D.,

Professor of Therapeutics and Electro-Therapeutics College of Physi  
and Surgeons, San Francisco, Cal.

Of all subjects, that of ether is to-day the most interesting. The interest is stimulated by the recent wonderful discovery of Marconi and others.

What is ether? Our answer is that it is the simplest form of matter; that there are four forms mutually complementary. They are named, in the order of their density, solids, liquids, gases, and ether. If ether is matter, it must have a chemi-

*Electricity is the Chemistry of Ether.*—Adopting as hypotheses the postulates that ether is matter, and that electricity is its chemistry, we will follow wherever they may lead. These facts will bear us out in stating that the ether molecule is composed of two atoms, which may be named positive and negative units. Here, then, are units of matter representing units of fundamental principles of force. We will formulate the conceptions that the positive unit of matter is identical with the unit principle of attraction, or concentrativeness; that the negative unit of matter is identical with the unit principle of repulsion, or diffusibility; that the combination of these forms the zero of force, and that they unite under the unit principle of the tendency of all matter or all force to equilibrium. Their union is zero, or complete neutralization, their separation is electric potential, and the phenomena of both conditions constitute electricity, in the broadest sense of the term.

It follows that the forces of the ether molecule are similarly satisfied—that the mutual neutralization of the units is complete within the molecule. The subject of electricity may be dismissed by stating that on the bases of our hypothesis we are prepared to explain all electric phenomena, and here we will briefly discuss the properties, and absence of properties, of the ether molecule.

The great law of force is a modification of Newton's law of gravitation, and is as follows: All forces react in proportion to the sum of their magnitudes, and in inverse proportion to the square of their distance asunder. This law recognizes repulsion as well as attraction—an important

entiation from Newton's law. Newton's law is incorrect in that it implies that the attraction of gravitation is identical with mass.

The two atoms constituting the molecule of ether being in contact, the factor of distance is eliminated when considering the action of extrinsic forces on ether. Consequently, we find that ether is without weight or gravitation force, without cohesion, and without a number of the potential properties of other matter. Because of the minuteness of its molecule, ether mechanically is incompressible, escaping through other matter as water through a sieve. Nevertheless, the ether molecule, assuming the globular form by its intrinsic forces, is distorted—polarized—in the induced magnetic fields of electric and chemic potentials.

The ether mass is elastic by virtue of the globular form of its molecules, and it is capable of propagating vibrations by its molecular impenetrability and molecular contact. Ether cannot originate vibrations because it has no molecular potential. Ether offers no resistance to bodies passing through it, as it has no weight and no frictional properties. For the same reason it cannot be projected like a cannon ball; it may, however, form vortices around an electric current, being acted upon by the current through the inherent attraction and repulsion of its molecular unit. In the latter case the positive ether-unit circulates in one direction and the negative ether-unit in the opposite. The immolecular neutralization of the unit-forces of ether is only disturbed by a greater extrinsic force, in accordance with the law of forces as above stated.

Ether is not a conductor of electricity, because the attractions and repulsions within its molecule are fully satisfied, and the free atoms of ether—electricity—do not adhere to the surface of the ether molecule; at least they do not do so in the presence of unneutralized or ponderable matter. Inter-molecular ether forms a physical equilibrium with other matter. It is the medium of manifestation of heat and light, and when polarized is capable of propagating sound.

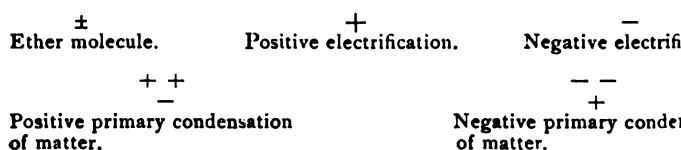
A body without weight, but having molecular impenetrability and elasticity, will propagate vibratory waves or undulations with the least possible resistance. A slight resistance may be offered by its immolecular forces to the distortion of its molecule by a vibratory blow. It is possible that, if freed

from the interference of the vibratory action of ponderable matter taking place on the earth's surface, interplanetary communication may be rendered practicable. As we ascend through the atmosphere is rarefied, the intermolecular spaces become larger; there is more intermolecular ether, and less interference of the ether part of ponderable matter.

Ether fills all space not occupied by other matter. It is ether between interstellar and intermolecular. Moreover, its atoms or groups are immolecular—form the constituent units of ponderable matter.

Molecules are of different sizes, varying from the simple ether molecule, containing two units, to organic molecules, containing trillions of ether-units.

The ether molecule, positive and negative electrification, and the first variations of molecules of ponderable matter, the simplicity of the ether molecular construction, are shown in the following formulæ.



Each molecule of the primary condensations is equal in potential to a free ether-unit of electric potential. By further condensation, accompanied with various reactions between positive and negative chemical elements, molecules of either positive or negative character, such as oxygen, and others of electro-negative character, such as potassium, may be constructed.

Thus it is clear that the potential of a complex molecule of ponderable matter, as manifested by chemic action, rests on the same fundamental basis as electric potential, *i. e.*, the proportion of unneutralized ether-units; and that chemic and electric potentials are fundamentally identical. These primary condensations of matter have been measured in the Crookes tube (article by Professor Thompson, Popular Science Monthly, August, 1901). From recorded experiments I have calculated that a hydrogen molecule consists of 6000 ether-units; from the chemic and physical character of hydrogen, I estimated that these units are divided into 5500 positivities and 500 negativities. Having found the constituency of hydro-

there is no difficulty in obtaining those of the molecules of other substances.

Having identified chemic potential with electric potential, we have only to study the latter to arrive at correct conclusions as regards the character of the phenomena of the former.

*A Concept of a Molecule.*—What is a molecule of ponderable matter? It is the physical unit. When not contorted by extraneous forces it assumes the globular form, its units being drawn toward a common center by its immolecular forces. It possesses the property of differentiating its poles. Its potential of unneutralized ether-units—the difference between the sum of its positivities and the sum of its negativities—is represented in a surrounding induced magnetic tridimensional field, which is its free or vibratory space. The potentials of complex molecules differ quantitatively and qualitatively, depending on the number and quality—positivity or negativity—of unneutralized ether units. Having differentiated poles, there must be immolecular distances between the majority of the positivities and the majority of negativities—that is to say, each positive unit is not completely in contact with a corresponding negative unit, as in the case of the units of the ether molecules. These distances are important factors in the neutralization of the forces of complex molecules, and allow the earth's forces—gravitation—or the potential of adjoining molecules—chemic action, osmosis, diffusion—to take possession of the intrinsic forces of a molecule. There are no free interspaces within the molecule.

Molecules have the property of polarization: by this is meant that all their poles of a kind point in one direction. This phenomenon is best illustrated by crystallization, which is caused by a movement of the intermolecular ether towards the surface of the liquid. When a molecule polarizes it must have equipotential hemispheres. If the relative numbers of the positivities and negativities of the molecule prohibit the hemispheres from becoming equipotential on polarizing, it either imbibes molecules of polarization as in crystallization—water, alcohol, etc., of crystallization—or it extrudes molecules of polarization as manifested in certain physiologic phenomenon such as cell-division, amœboid movements, etc. The former may be called associated molecules of polarization, and the latter dissociated molecules of polarization.

It is not too much to say that on the bases of our primary hypotheses all electrical, chemical, and physical facts, including those of light and heat, and the laws governing them, can be made plain.

From the foregoing we will carry forward three fundamental properties of complex molecules. They are as follows: (1) Molecular potential, depending on number, quality, and relative placement of the unit-constituents of the molecules, and on the character of the opposing or neutralizing force; (2) molecular induced magnetic field; and (3) molecular polarization. They are associated with, and in a large measure essential to electric, chemic, and physical actions, and we believe that they are of equal importance as factors in the production of physiologic phenomena.

(*To be continued*)



## MEANS AND MODES IN RADIOGRAPHY.\*

BY WILLIAM BENHAM SNOW, M. D.

Since the discovery by Professor Roentgen of the properties of the rays which bear his name, there has been a constant effort to improve the apparatus and to discover the proper modes for obtaining the best results under varying conditions.

During this period, in the hands of inexperienced operators, with all sorts of apparatus, much harm has been done in various ways, tending to check the advance of the new science.

This is in a large measure excusable when we take into account the general ignorance of our profession of the constantly advancing knowledge of the properties of electricity, and the fact that the X-ray possesses certain properties which are deleterious to human tissue, when improperly applied.

As well we may add, there has been a disposition to expect more from this new means of diagnosis than a common-sense reflection could permit. A shadowgraph of particular tissue or foreign substance, which the rays do not readily penetrate, will be well defined or otherwise in proportion to the penetrability of other intervening tissues, and the intensity of the ray employed—you cannot observe a man behind a tree, and but indistinctly in the shadows of night.

These effects were recognized by the early observers, and students who have known the facts and truths laid down by those who perfected the science during the early years, both in point of apparatus and technique, have not sought to accomplish the impossible, nor brought discredit upon one of the greatest discoveries of the nineteenth century.

Inexperience, ignorance, and inferior apparatus have brought into disrepute to a great extent the employment of the Roentgen ray.

The writer well knows that in many great hospitals in this country, and with many great surgeons, this valuable means is not employed because of the medico-legal significance, and the fact that good results do not always obtain from its use.

Too many surgeons look askance upon the possible mischief of the Roentgen ray. A few, such as Weigel, Abbey,

\* Read by title at a meeting of the American Electrotherapeutic Association at Buffalo, September 5, 1901.

Beck, Lambert, and others, who have themselves become familiar with the methods, no longer take an uncertain view of their value and practicability.

Young physicians have not been generally taught in a thorough and practical way the proper modes of employing the valuable means of diagnosis, because such a course of instruction has found its place in the curriculum of so few representative medical colleges—a matter to be regretted.

The main object of this paper is to call attention to the fact that (1) proper employment and methods are imperative; (2) that too much importance cannot be attached to its introduction to the course of instruction in every medical college, which it has not already been included; and (3) for the purpose of referring in a general way to the means and modes essential to success in X-ray investigations. The first two have been briefly considered.

The essential means are: (1) a thorough knowledge of the apparatus and its use with reference to the object sought; (2) an efficient coil or static machine; (3) a tube adapted to the apparatus and case under consideration; (4) a protective screen or fluoroscope when demanded; (5) a darkened room when the screen is to be employed; (6) means of locating a foreign body, when necessary, by making two exposures in planes perpendicular to each other; (7) means of protection against the possibility of causing a local dermatitis; (8) sensitized plates adapted to X-ray work; (9) developing outfit, including developer, etc.

The modes which call for particular attention are: (1) the position of the patient with reference to the tube and sensitized plate; (2) the choice of tubes for special cases; (3) the distance at which we place the tube; (4) the length of exposure; (5) the development of the negative; (6) the choice and care of the plates; (7) the localization of a foreign body; (8) examination of the chest for pulmonary tuberculosis; (9) the interpretation of the negative; (10) the precautions against causing a dermatitis.

As means and modes so often call for joint consideration, no pretense will be made of considering them according to the above numerical arrangement, but care will be taken to include them all.

No professional calling more certainly requires familiarity

with the means employed and the methods of employing them than the subject under consideration, if good results, without casualties, are to be obtained in difficult cases. And even then, in most skillful hands (without casualties, however) the efforts will not always be crowned with success, which should not prevent a second attempt. None are so skilled, we believe, that they can harmonize the individualities of the tube, current, sensitized plate, patient, and the time necessary to obtain the result sought in every difficult case. Tact, familiarity, and experience with every detail alone will obtain anything approaching uniformity in results. Like every other department of medicine requiring special skill, it belongs to a specialist within the ranks of the profession. No greater breach of professional courtesy can be shown than sending patients for X-ray examination to a non-professional operator, because it is an art belonging to the profession, requiring anatomical knowledge, and involving dangers to the person of the patient. It would be as professional to send a patient suffering from a fracture or dislocation to a bone-setter.

Opinions of equally good authorities differ materially concerning the character of apparatus best adapted for exciting the Crookes tube. The conclusion may be drawn, however, and the comparison of results warrants it, that equally good skiagraphs are obtained from coil and static apparatus.

An efficient coil apparatus should have a sparking capacity of at least ten inches, and be provided with a modern interrupter and current and ampere controller; altogether a technical apparatus requiring great care to prevent injury to the coil or the tube. In the hands of an expert who is familiar with all details, there need be but little difficulty in successfully managing the parts, but it certainly has been a source of aggravation and expense to many who have sought to employ it without careful study and attention to particulars.

There are, however, several modern machines constructed which require much less care than the earlier productions. One feature which recommends these forms of apparatus is their portability, relative to the static machine, making it possible now that the storage battery of an automobile may be utilized, or by connecting it to the street current, to make use of it under circumstances where it would be more difficult to employ the latter. There are other claims of the relative merits,

made by those who employ the various coils, which can only be accounted for by lack of familiarity with apparatus other than their own, such as the statement by one authority that a stone in the kidney has not been demonstrated with the Holtz machine, an error to which we can attest.

The static apparatus possesses advantages, and disadvantages also; but, on the whole, in the writer's opinion it has the balance in its favor, because it also serves a valuable therapeutic purpose, which fact commends it for use in hospitals and institutions as well as in the offices of physicians and surgeons. As to the make or style of static machines best adapted to therapeutic purposes, we have this to say: There are a few good ones, and several that would answer no sort of purpose for efficient treatment. Generally speaking, a Holtz machine having *at least* eight revolving plates thirty inches in diameter, is recognized by authorities as the best type of apparatus.

There is at present with operators a disposition to employ machines having twelve revolving plates and upward; but the plate machine, however, of the sort specified will accomplish good results under most circumstances as any other, and for therapeutic purposes the writer is inclined to prefer the Holtz plate machine. The chief objections to the static machine for the purpose under consideration are the influence of weather conditions, and the fact that it is not easily moved about. The former objection will hereafter be overcome by the writer by keeping the machine in a small room, which may be easily dried, when the necessity arises.

There are a great variety of X-ray tubes now on the market, some best adapted to one apparatus and others to another, the discussion of which we will not consider. As constructed, such tubes have an aluminium cup at the cathode, and a platinum anode plate placed at an angle that will project rays at the proper obliquity, the two poles being separated by two and one-half to four inches, and varied to meet the capacity of the exciting apparatus.

A point always to be considered is the degree of vacuum, which marks the character of a tube as high or low (hard or soft) ever changing qualities, the tubes constantly becoming of higher and higher vacuum until the capacity of the apparatus will no longer excite it. As the tube becomes higher, the radiance becomes more penetrating at the expense of detail.

There is another feature of Crookes tubes which seems, so far, unexplainable, and that is what may be termed the individual characteristic of the tube, which marks its excellence or particular detail and is not dependent altogether upon its vacuum for excellence or uniformity. Such a tube may be most explicit in detail, when the vacuum is low, for special work, but not a good tube in any particular when it becomes high. In another, the exact opposite may obtain. This fact explains many diverse opinions and various results obtained. On general principles, when detail is sought, the soft tube and relatively long exposure will give the best result. So in attempting to discern the presence or absence of stone in the kidney, we select a medium tube. If, however, we wish to examine a knee joint, thigh, or pelvis, we select a high tube, making a relatively short exposure. The fluoroscope is of great value in making examinations when the case does not call for the skiagraph, and in determining the most advantageous position in which to place the part with relation to the tube and sensitized plate, when a skiagraph is to be taken, in order that the most accurate result may be obtained. The choice of materials for fluoroscope and screens is platino-cyanide of barium, which gives a superior fluorescence, and does not deteriorate as those of tungstate of calcium do.

A screen instead of a fluoroscope used for demonstration and class work, because it can be seen by several persons at the same time, and must be used in a darkened room, when the shadows are remarkably well shown.

For making examinations of the chest, a screen should be employed large enough to cover the thorax, that comparative examination of the two sides may be made. Skiagraphs of the chest are never so satisfactory, because the movements give impressions in the negative which are necessarily incorrect.

What has caused much disappointment and adverse criticism from surgeons has been the failure to accurately locate a foreign body that it may be readily removed.

If two exposures are made which are perpendicular to each other, after first determining the approximate location with the fluoroscope, from the sides at which the exposures are to be made, and taking care that the anode plate is placed perpen-

dicular to the location of the object sought, we will rarely to locate it with precision.

The writer employs a method for taking the two skiagrams perpendicular to each other, as follows:

The patient is placed in position for making the first exposure when a strip of board about 4 x 20 inches is secured firmly to the part to be taken, above or below the margin of the skin.



Fig. 1.

tized plate, having first decided what will be the most desirable planes. By means of a plumb line and square, or a spirit level (Fig. 1.), it is secured in an exactly horizontal position, and the first exposure is made. The patient or part to be taken is then moved into a position at right angles to that previously occupied, the strip still held securely in place, to make certain that the position is correct; with the plumb line or level and square see that the strip previously horizontal is now perpendicular, and make the exposure (Fig. 2.), and the planes of the two impressions are certain to be perpendicular to each other.

The best means of avoiding the so-called X-ray burns is to

dermatitis is to make exposures with reference to time, quality of tube, and the distance of the tube from the person of the patient:

- (1) The time should never exceed thirty minutes (best results under possible conditions rarely require more than fifteen minutes).
- (2) A long exposure should never be made when employing

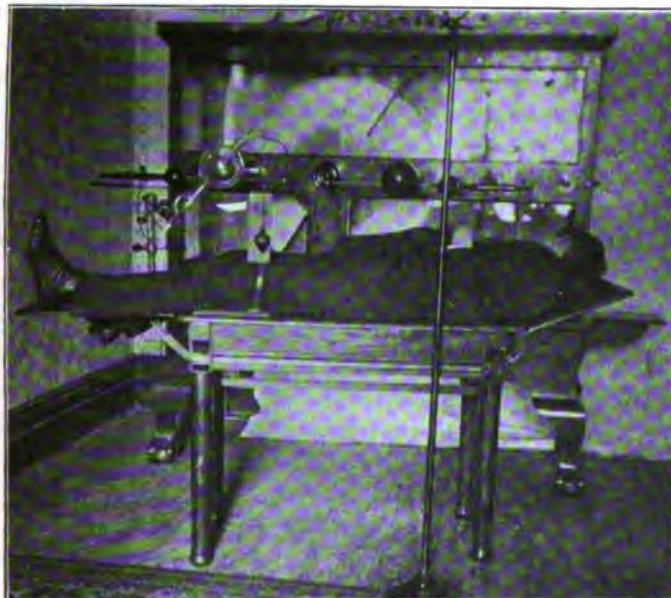


Fig. 2.

a low vacuum tube, and exposure with tube never nearer than twelve inches from the person of the patient.

- (3) The usual rule of distance for tube from patient is eighteen to thirty inches.

The writer has always observed the above rules, and has never produced a case of dermatitis when employing the X-ray in skiagraphy.

A precautionary measure now employed, but not demonstrated in practice or analogy as practicable or proof against carelessness, is grounding an intervening aluminium plate. We believe that this measure should not preclude the taking of other precautions.

In the choice of sensitized plates, if only rugged shapes or outlines, as of bone fracture or dislocations, are to be shown, any fresh sensitized plate will answer the purpose. When, however, detail is sought, as when seeking to show the outlines of viscera or calculi, double- or triple-coated plates, especially prepared, experience teaches are to be preferred. We believe that every physician will prefer to develop his own plates, as best it will give better satisfaction, barring the possible opportunity to lay the cause for a poor result at the photographer's door. The process must be performed with care and with the object sought well in mind. If detail is desired, and the image begins to appear too soon, sufficient bromide solution must be added to slow the process, and the negative must be watched that it may not be over developed.

It is not possible to enter further into the discussion of the detail in a general paper, as there is so much that must be said on many points.

The interpretation of the image is always best made from the negative, because the picture is reversed when printed, and the details are better studied from the negative.

It often calls for some experience and study to discover the details of an image when contrasts are not well defined. Particularly in no particular is such care more necessary than in making out a suspected calculus, which, when once definitely defined, is plain enough to make the diagnosis certain.

We are well aware that many important observations have been omitted from this paper, which is already longer than we first intended. If, however, it should call forth discussion, which will bring out valuable suggestions, its purpose will have been served.



## THERAPEUTICS OF DRY HOT AIR.

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## CHAPTER VIII.

## ARTHRITIS DEFORMANS.

The reason for placing arthritis deformans third in the list of diseases in the treatment of which hot air is important is not because of the rapidity or immediately apparent brilliance of its action in the affection, but because the agent is one of the two only measures that can here be relied upon to give anything like satisfactory or even moderately certain results. The other measure is static electricity. This disease has been hitherto, and is now, under other therapeutical measures, the despair of the medical profession. It has always been my contention that if hot air did nothing but relieve the agonizing pain of acute rheumatism, it would be entitled to a place in the highest rank of therapeutical agents. We have seen that it not only does this, but that it lessens by a large percentage the duration of the disease, and transforms rheumatism from one of the most obstinate into one of the most tractable of ailments.

In arthritis deformans we are again struck by the immense claim which hot air imposes upon our respect, because of the power which it exhibits of rendering useful and comfortable many lives which would otherwise be spent in hopeless and helpless misery.

The correct diagnosis of this disease, from a therapeutical standpoint, is of the utmost importance, because it is one of those diseases in which the treatment of conditions closely resembling it is usually ineffective, and sometimes positively harmful. Because of its importance, I shall touch briefly upon some of its aspects that do not come strictly within the scope of this article. The literature extant upon the subject is not

satisfactory in enabling one who has not seen a good deal of the disease to form reliable ætiological, diagnostic, and therapeutical judgments.

Ætiology.—I think there can now be little question that the lesions observed in arthritis deformans are dependent upon impairment of the trophic functions of nerve centers in the sympathetic and spinal systems. The most prominent reasons for this conception of its causation are that its constant lesions, viz., dystrophy of the joint cartilages and articular portions of the bones, the pigmentation and textural changes in the skin, and the atrophy of the muscles controlling the affected joint, are all of a tropho-neurotic character; that it rarely, if ever, occurs in an individual who is not of a neurotic tendency, or debilitated by some illness, as la grippe, typhoid, nervous exhaustion, etc., or constitutionally weakened by some diathesis tuberculous, lithæmic, or otherwise; and that lesions, at least of the joints, identical with those encountered here are also met with in degenerative diseases of the spinal nerve tracts—as tabes, for instance. In cases of so-called "idiopathic" arthritis deformans that have come under my observation, I have never failed to find some one of these causative factors present, and I do not believe that the term "idiopathic," as applied to this disease, will much longer stand the scrutiny of scientific observation.

It is not at all probable that the disease is "rheumatic" in its nature, although an acute attack of rheumatism in one whose nervous system is predisposed may precipitate the disease. I have had several such cases under observation. When such a case is encountered before the active rheumatic influence has subsided, and if the trophic functions have not been too much impaired to recover if the exciting cause is removed, anti-rheumatic treatment will frequently cure the arthritis deformans by removing the rheumatism which had set up the trouble. If the predisposition to the disease is constituted by the lithæmic or gouty diathesis as I believe it occasionally is, then iodide of potassium, colchicum, or other drugs of a like nature will always benefit and sometimes cure the affection. But when the disease is not dependent upon or precipitated by a pathological condition amenable to what we look upon as specific medication, nothing benefits it in the least except therapeusis directed to the trophic nerve centers, and anti-rheu-

matic or anti-lithæmic remedies frequently cause an increase in the intensity of the symptoms. Local measures exclusively never accomplish anything but temporary relief of pain, while measures addressed to the nerve centers themselves accomplish a great deal in the way of permanent cure.

This is reasonably conclusive evidence that the disease is not primarily local. It is also improbable in the highest degree that local pathology of the nature encountered in arthritis deformans could produce, by any exaggeration of reflex phenomena, such profound organic disturbances of muscles and skin as are constantly met with here. Further, the disease is always accompanied by marked evidences of irritability of the spinal, and sometimes of the cerebral, centers, for the explanation of which the presence of pain is not always sufficient.

These facts point most strongly to impairment of the trophic centers as constituting the intrinsic and primary ætiological element. If this is true, then it follows that all nerve debilities—neurasthenia, hysteria, etc.—are not necessarily so devoid of evil terminations as has been generally believed, and that thorough and efficient treatment of the same should be instituted as soon as they come under observation, and persevered in until they are removed. It is probable that when this plan of dealing with the so-called functional disturbances of the nervous system is generally adopted, we shall encounter arthritis deformans and some other grave diseases less frequently. I have had under observation several cases of what appeared to be simple nervous debility at first, in which slight arthritic symptoms developed. These were entirely done away with by treatment addressed to the original condition, and the occurrences strengthened considerably my belief in the nervous origin of the disease.

**Diagnosis.**—At the present time, unfortunately, this disease is more frequently overlooked and miscalled than probably any other to which flesh is heir. This is due to the fact that it has only very recently been recognized conclusively as a distinct disease entity, which has prevented the constant and characteristic symptoms from being studied and grouped so as to make it recognizable by physicians at large, and to the additional fact that it has hitherto been almost absolutely intractable to all known treatment, which has discouraged attempts to differentiate it because of the apparent uselessness of the result, if at-

tained. The development of hot air and static electricity, however, has changed these conditions, and *arthritis deformans* can now be arrested and the affected joints restored to useful function in the vast majority of cases.

The signs which are constant accompaniments of the disease are a peculiar pigmentation and satiny dryness of the skin, pain, and nervous debility of variable intensity, which can always be demonstrated as having preceded the attack. In addition to these, atrophy of the muscles controlling the joint and impairment of their function are usually, but not invariably, present. Tonic spasm of these muscles not infrequently accompanies the acute stage. For instance, I once had a patient under observation who developed a lockjaw from involvement of the maxillary articulation, which compelled me to feed him upon liquids only, through his teeth, for two weeks. More or less limitation of the masticatory movements is always present when this articulation is affected. Tonic muscular spasms sometimes become permanent contractures when the disease is not controlled and ankylosis results.

The pigmentation of the skin occurs as maculæ, varying in size from that of the head of a pin to that of a quarter of a dollar, the smaller sizes predominating, irregular in outline, and resembles the freckles seen upon elderly people more than anything else. It differs from these, however, in possessing a characteristic yellowish brown, dirty look, which is readily distinguishable to an experienced observer, and also in that it is not confined to those parts of the body which are not covered by clothing, as is the case with true freckles. It usually is most in evidence on those portions of the skin contiguous to the affected joints, but may frequently be found also upon remote parts of the body, particularly the back, abdomen, extensor surfaces of the limbs, and the clavicular regions. I have never failed to find this peculiar pigmentation to some extent in every case of *arthritis deformans* that has come under my observation, and although it is frequently present in individuals who are not suffering from the disease, yet I have come to regard it, when taken in connection with other symptoms, as one of the most valuable of the differential signs.

The textural changes sometimes resemble the "glossy skin" seen in many cases of impairment of the function of peripheral

erves, and sometimes it does not exhibit any difference in color from that of the surrounding integument, but has a peculiar dry, smooth, soft look and feel, like satin.

Cases are sometimes met with in which the skin about the joints looks greasy and is covered with a slight perspiration almost constantly, which condition is also encountered in other opho-neuroses.

The pain is of two varieties: that in the joint itself ordinarily described by the patient as "boring" in character, and that in the nerve trunks from which the joint and its musculature are innervated. The first-mentioned is usually constantly present in the acute stage. At any stage it is increased by movement or by sharply bringing the articular surfaces together, as by tapping sharply and suddenly the bottom of the heel of the extended leg when investigating a hip. Palpation of the affected joint provokes pain, and the firmer the pressure the greater the pain induced. Occasionally a case is encountered, specially in old patients, where no pain of any sort is present while the affected member is at rest, but it is always provoked by motion. The pain in the nerve trunks is paroxysmal, nearly always worse at night, and there is usually present in acute cases a constant, dull, aching soreness. Portions of the nerve are usually sensitive to pressure, as in other neuralgias.

A frequent cause of pain in cases where the larger joints are affected is spasm of the controlling musculature occurring during sleep. As soon as the patient relaxes into sound slumber he is awakened by excruciating pain, and finds the affected joint strongly flexed. This condition is sometimes sufficiently persistent to prevent securing the necessary amount of sleep, and the victim becomes so fearful of the agony of the awakening that he is afraid to attempt it.

A characteristic feature of the pain, when the hip joint is involved, is that it appears in the groin as well as in the hip. This peculiarity is very common in arthritis deformans, and very rare in most other affections of this joint from which it would have to be differentiated.

The nervous debility does not differ from that due to other causes, except in its profoundly trophic character. The tendon reflexes are somewhat increased usually; the secretions of the digestive ferment-producing glands are impaired, and departures from the normal, both gastric and intestinal, are in

evidence. Sleeplessness sometimes from pain, but also sometimes from pure irritability of the cerebral centers, is frequently a troublesome symptom. As a rule, however, patients nap sufficiently during the day to make up for what they lose during the night.

Atrophy of the muscles controlling the joint is a very constant phenomenon, and is usually accompanied by tenderness of the same upon pressure, as in pinching. Impairment of function is present in variable degree, and in many cases presents the characteristic also met with in rheumatism, viz., the muscles can be contracted up to a certain point, when further movement ceases, as if the joint were hung on a ratchet. In other cases it consists of simple weakness, and in still others of a reflex inhibition of function from the pain in the joint which movement excites.

The elevation of temperature varies from half a degree to a degree and a half Fahrenheit, very rarely more, and presents a very constant general curve, being below normal in the morning, beginning to rise about eleven or twelve o'clock, and reaching its maximum in the early evening. In severe acute cases, especially in young patients, it sometimes reaches 101 F., but I have never seen an uncomplicated case in which it went above that point. It will be observed that this resembles the temperature curve characteristic of some other diseases, notably tuberculosis, and it is not always the easiest thing in the world to differentiate arthritis deformans from joint tuberculosis at the first visit. As a rule, however, the temperature of tuberculosis runs higher than that of arthritis deformans, its curve is more irregular, and it reaches its maximum elevation earlier in the day. In doubtful cases the development of other characteristic signs will soon settle the question.

The urine of arthritis deformans very frequently contains a trace of albumin, probably due to renal irritation from excretion of products of faulty metabolism, as it rapidly disappears under body hot-air treatments, but I have never observed casts in uncomplicated cases.

X-light is a very useful diagnostic agent in doubtful cases of some standing. By it can be demonstrated absence of cartilages which have been absorbed, a characteristic lesion of the disease when taken in connection with other symptoms, and by reason of which the bony surfaces are closely approximated;

a very different picture from that which obtains in healthy joints. Osteophytes, when present, are also observable by this means, and bony ankylosis is easily differentiated from the fibrous variety.

I have said nothing about the external appearances of the joints, because they do not possess any value as differential signs. One or more may be involved, the swelling may be diffuse or nodular, the skin over them may be shiny or dull, red or without presenting any indication of inflammatory action. We simply have a pathological joint, any of the appearances of which may be duplicated by several other affections, and when these other affections enter the diagnostic problem it is invariably necessary to go outside of the external appearance of the joint for the decisive information. The same thing applies to the muscular contractures.

It will be observed from the above that the more prominent conditions from which arthritis deformans is to be differentiated are rheumatism, especially the chronic variety, chronic gouty and lithæmic conditions, neuritis, neuralgias, myositis, myalgias tubercular, syphilitic, and traumatic joint and bone lesions, and when symptoms are encountered pointing to the spinal column or hip joints as affected by a disease process, tumors in the thoracic or abdominal cavities, so situated as to involve the nerve trunks and plexuses in these regions; and, lastly, various diseases of the peripheral nervous system. It is frequently only by a process of careful exclusion and the closest scrutiny of the history of the case that a correct diagnosis can be reached. It can be reached, however, positively, satisfactorily, and at once, in nine cases out of ten, and no pains should be spared to secure this end, in view of the fact that the disease is no longer to be classed with those that are not amenable to treatment.

I will close this brief section upon the exceedingly important subject of diagnosis by calling attention to the following additional facts which bear upon this point.

Although in the commonest form of the disease, which occurs almost entirely in patients over forty, the small joints are first attacked, and the lesions nearly always bilateral, yet this is not always the case in all forms of the trouble. An attack may commence in the larger joints, run its course and recover without having involved the smaller joints at all; or it may be

confined entirely to one large joint, as the hip, for instance. Some of the severest cases are of this character.

Involvement of the maxillary articulation is a very characteristic feature of this disease. It occurs with the utmost frequency in other diseases from which it might be necessary to differentiate it.

While the onset is usually gradual, with a beginning so insidious that the patient is not aware that anything is wrong until a wrench calls his attention to the sensitive member, it may develop as suddenly as acute articular rheumatism, leaving the patient helpless upon his bed in a night.

When the disease attacks a person under thirty years of age, it usually involves both large and small articulations, and in these cases the worst phases of the disease and those most resistant to treatment are encountered.

## CHAPTER IX.

### ARTHRITIS DEFORMANS—(*continued*).

Treatment.—Hot air alone will cure many cases of arthritis deformans, and so will static electricity, but as noted previously, they are the only agents in the whole category of therapeutic measures of which this can be said. Here, as in most other diseases, however, neither alone will do what it will when combined with other measures, and, in a disease which is so resistant to all therapeusis as is the one under consideration, it is important to bend upon us to use all the resources at our command. There are many cases that will not recover at all unless this is done, and in all the progress is greatly hastened by the combination. Under the very best of conditions recovery is a matter of months, but when we reflect that in the past we have been unable to accomplish scarcely anything with any degree of certainty in any length of time, the possession of a measure which will restore to these victims useful joints and comfort in living is a matter upon which we may most sincerely congratulate ourselves, however long it takes to do it. The different elements of treatment will be considered separately, and lastly their most advantageous combination noted.

Hot Air.—The body treatment is the sheet anchor, because through it is secured the influence upon the trophic centers.

which constitutes the curative element. The temperature should usually not be less than 350° F., but will be governed by circumstances. As atheromatous arteries are commonly met with in these patients, it may be necessary to give less heat during the first two or three treatments, until the arteries have softened some; but 350° F. can be attained safely afterward. The guide is found in the circulatory phenomena. When the heart begins to labor unduly, which is indicated by a visibly quick, hard, strenuous throbbing of the cervical blood vessels, or when nausea, dizziness, or tension in the ear drums have been induced, it is time to stop. Irregularity of the pulse is also usually an indication that the treatment should come to an end, but this is not absolute, and depends upon the conditions surrounding the individual case. Sometimes the first treatment cannot last more than fifteen minutes, and the requisite rise in temperature and pulse cannot be attained, but as the arteries begin to regain their elasticity,—which they usually do in two or three treatments,—the response is more and more kindly, until finally the proper amount of influence upon the nerve centers can be induced.

The toes of patients with this disease seem particularly liable to suffer from the heat during treatment, I presume because of inefficiency in the blood circulation; hence it will frequently be necessary to place several layers of towels over these members to maintain comfort. Sometimes even this fails to secure comfort, and the toes must be uncovered and exposed to the air until the burning sensation has disappeared, when cool towels may be applied and treatment resumed. These maneuvers should be persistently repeated until the pulse and temperature indicate that the desired amount of central nervous influence has been secured. Efficient treatment of these cases will frequently take an hour or two, but the point of efficiency must be reached or the patient will not be benefited. The mere induction of perspiration, however profuse, as has been stated in a previous page, does not mean that the treatment has been properly completed. The requisite rise in temperature and pulse does.

The local treatment does not constitute an important element in the management of this disease, and I have never seen it exercise any curative influence. As it is sometimes very efficient in relieving pain temporarily, however, it should

always be tried when this phenomenon is troublesome; and the technique does not differ from that applicable to rheumatism, except in that, as it is only useful as a pain-relieving agent, the temperature need be pushed only high enough to secure the analgetic effect—whether it is 200° F., or more.

#### ADJUNCTIVE MEASURES.

Static electricity.—The use of this agent has always been of marked benefit in arthritis deformans through its influence upon the general nutritional functions, but it was not until Dr. Snow of New York City developed the use of the Morton wave current in the treatment of the disease, in 1899, that its full powers were revealed. Results are reported which rival those attained with hot air. Personally I have never had any experience with cases treated with static alone, but I always use it in connection with hot air, and can testify to its profound helpfulness. I give it at least once, and sometimes twice daily, in the form of the Morton wave current to the spine or joints affected, the breeze, and spark.

The wave current preferably, the breeze or brush discharge as second choice, produce good results in acutely inflamed joints, and give sedative effects in the majority of cases, that are unequaled by any other measures. When the joint has progressed beyond this stage, the effect of long, thick, single sparks is sometimes remarkable in reducing enlargements, restoring lost function, and inducing sedation, and is under all circumstances the most satisfactory treatment of the older lesions of this disease, with the sole exception of the wave current, which is sometimes here as elsewhere the remedy par excellence. Care must be exercised not to begin sparks too soon, or the inflammation in the joint will be aggravated thereby. Administer them cautiously at first, and watch the effect.

The static wave current over the solar plexus and abdomen will also usually give excellent results in the gastric and intestinal indigestions which are sometimes quite troublesome. When it fails, drugs are indicated.

Faradic.—This current plays very little part in the treatment of arthritis deformans when a static machine is available, but when it is not, a good high-tension coil is very useful as a temporary sedative. The current is passed directly through

the aching joints, and the relative positions of the polarities is usually a matter of indifference. In the form of spinal and general faradization it exercises a very helpful influence upon the trophic centers and general metabolism. In rare cases it will be found that the coil gives sedative results in this disease superior to those produced by the static modalities or hot air.

**Galvanic.**—Galvanization of the brain and spinal cord, positive polarity, negative electrode over the solar plexus, twice weekly, is of marked service in combination with hot air and static. When treating the brain, of course the usual great care must be exercised, beginning with the current at zero and increasing very gradually, diminishing the volume immediately if dizziness, faintness, or nausea occur. It is very easy to throw a patient into syncope during this operation. Usually 3 milliamperes for two minutes will be enough. In the cervical region the milliamperage may be increased to from 5 to 15, according to the patient's tolerance, watching carefully for signs of phrenic or pneumogastric irritation, for three minutes. The dorsal and lumbar regions may be treated for from three to five minutes each, and, as no dangerous symptoms are to be feared in these vicinities, the amperage may be increased until the cutaneous sensibilities revolt, which means ordinarily from 20 to 30 milliamperes.

In treating muscles in a state of tonic contraction from irritation of the nerve trunks supplying them, as in the wry-neck frequently met with when the cervical vertebrae are involved, the positive pole of the galvanic battery, applied stable over the irritated nerve and the cord at the point whence it takes its origin, and labile over the contracted muscle, is very helpful. It mitigates the aching soreness considerably, and does a great deal toward relieving the spasm.

It has been stated that the soreness in the joints may be relieved by treating them with weak galvanic currents, positive polarity, using a hot-water bath in which the affected members are immersed as the active electrode. Although I have tried this repeatedly, I have never been able to convince myself that I perceived any more result from it than would be produced by the hot water alone without the current, and in acute cases I have occasionally seen the suffering increased. It is unquestionably greatly inferior to the static modalities, faradism, and hot air in this situation.

Drugs.—In administering drugs it should be borne strictly in mind that no medicine is admissible which will depress the nervous system. It is only by maintaining the general trophic functions at their highest point of efficiency that we are able to control the process at all. Medicines internally are indicated for two purposes—to mitigate the symptoms and to favorably influence the course of the primary disease process.

Among the most prominent symptoms which can be favorably influenced by drugs are gastric and intestinal indigestions, and constipation. For the first, bismuth subnitrate, charcoal, carminatives, and the digestive ferments may be used. For the second the various mineral waters, Veronica, Rubinat, Hunjadi, etc., or magnesium sulphate, are most efficacious. When they fail, a combination of aloin, strychnine, and belladonna will give excellent results.

Paroxysms of excessive pain in the joints and nerve distribution will sometimes yield very kindly to applications of Baume Analgesique (Bengue), but it will occasionally be necessary to resort to coal-tar derivatives. They should only be given in small doses, and for a few hours at a time, and never until it has been demonstrated that hot air or electricity are inefficient in affording relief. Opium and morphine are never admissible, because of their unfavorable influence upon general metabolism. It is because the same property is inherent in the coal-tar derivatives, although to a less extent, that their use should be restricted as much as possible. It will fortunately not usually be found necessary to combat pain with drugs, as the physical measures ordinarily mitigate it to such an extent that it is bearable, and victims of this disease are so habituated to suffering that they bear a moderate amount without undue complaint.

The drugs which favorably influence the disease process, *per se*, are alterative tonics whose special sphere of action is the central nervous system. The best of them are the chloride of gold and sodium, arsenic, strychnia sulphate,—which drug is not always admissible, as it sometimes increases the nervous symptoms,—iron, cod-liver oil, the tissue remedies, and lastly, and least frequently beneficial, the iodide of potassium.

The salicylates have something of a reputation in this disease, but I think without any foundation in fact, and the fallacy probably arose in the following manner. We occasionally have

an attack of rheumatism, acute or subacute, engrafted upon a case of *arthritis deformans*, and of course the salicylates would be beneficial here. Enough care is not usually taken to make an analytical and differential diagnosis, and the benefit is set down as due to the influence of the salicylates over *arthritis deformans*. In the same way the disease is sometimes caused originally or increased subsequently by a gouty, lithæmic, or syphilitic taint, and here the iodides would get more credit than actually belonged to them, if they had been administered. Again, it is conceivable that chronic malarial intoxication might be a causative factor, and then quinine would unquestionably benefit the patient. I mention this because it has been stated that quinine is of use in this disease. Personally I have never seen a case in which the element of malaria was traceable, and have never observed that any benefit followed the use of quinine.

As suggested by the above, any diathetic or acquired ætiological factors amenable to specific medication should be carefully sought for and treated by appropriate measures when present, but when the disease is not due to them,—and I do not believe that it is in the majority of cases,—the drug treatment confines itself within very narrow limits.

The therapeusis which has given me the most satisfaction as a routine combination is as follows: A body hot-air treatment three or four times weekly, the frequency governed by the effect upon the patient; galvanization of the brain and spinal cord twice weekly; and static every day in the form of the wave current, alternated on successive days with sparks to the spine in all cases and to the affected joints in appropriate cases. The drugs indicated are administered in conjunction with the physical measures, and the current from the high-tension coil for sedation whenever the pain becomes uncontrollable by the above-mentioned agents. This general plan is modified to suit the idiosyncrasies of individual cases.

Finally, in connection with treatment I will say that the ordinary form of the disease which begins in the small joints, and is markedly chronic in its course, usually yields fairly readily to treatment, even when it occurs in elderly people; but that form which involves the large articulations requires persistent and strenuous management in proportion as the debility of age is manifest. In a patient over seventy it yields very slowly.

In some cases the improvement under treatment in the general condition will be marked, but the local lesions will show no signs of permanent gain for a week or two. This is probably due to the fact that the local lesions are dependent upon trophic impairment of the central nervous system, and that they will not improve until these centers, which control their nutrition, have been brought to a state of efficient action. It is while this process is going on that they are at a standstill. Perseverance, however, will usually bring about the desired result, and this is another bit of evidence in favor of the primary ætiological conception of the local lesions herein stated.

Cases of arthritis deformans are very apt to relapse during the first year after recovery. The most common cause is an attack of some acute disease of a debilitating nature, as la grippe. Another cause is that patients who have been accustomed to an active life before the disease disabled them are so elated and confident at being again in a condition to do something after months, and sometimes years, of enforced idleness, that they overwork. The overstrained nerve centers yield as they did before, and another outbreak obtains. It may appear in the same old joints, or entirely new ones may be invaded, and those affected previously escape altogether. The victims should be gotten under thorough treatment again as soon as possible, and this should be persevered in until recovery supervenes. Perseverance is a grand omniscient word in the treatment of this affection.

## Editorial.

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### MEDICAL ELECTRICITY.

TO be known as an electro-therapeutist by the profession has been to be looked upon as a sort of professional monstrosity. Now, as at no previous period, has a positive reaction been manifested, and the heretofore "electrician" (as he was often called) finds the numbers who would enter the field very numerous indeed. These raw recruits find a great field of possibilities, but success calls for study, application, and experience which too few appreciate. The harvest is being reaped by the manufacturers of expensive apparatus, and the victim is certain to be the medical novice who knows so little that he is readily taken in by the salesman who flatters his conceit and takes his cash.

The establishment of the fact that the X-ray is powerful to relieve and cure malignant tumors has attracted the attention of the whole profession. Many who would never have recognized anything in electro-therapeutics find themselves irresistibly drawn into the enchanting and fertile field of medical electricity. The dermatologist must now employ electricity in the form of condensed light, or the X-ray, in the treatment of his cases, or soon find himself in the wake of his enterprising fellows. If he is judicious, and provides himself with an apparatus which will produce other therapeutic as well as X-ray effects, he will soon become conscious of the fact that there are other electrical measures as well as the X-ray which are equal, if not superior, to the X-ray in the treatment of many heretofore stubborn skin affections, and step by step, as he becomes familiar with his subject, he will find himself a full-fledged electro-therapeutist, enthusiasm included—for, as a great surgeon recently said, "Those who become familiar with the scientific use of electricity seem always to become enthusiastic"; because there is so much to be derived from its use.

The same will be true of the surgeon who treats cancer with the X-ray. He will find many benign tumors also melt under the radiance, and eventually substitute electricity for actual cautery, strapping, rest, etc., in the treatment of numbers of

acute and chronic inflammatory joint affections. The neurologists, who have been looked upon as the men who understood the uses of electricity, from present indications will be the last to recognize how valuable an agent high potential electricity is in the treatment of nervous diseases. If some miraculous agency, such as the treatment of cancer by the X-ray, can be applied to some supposedly incurable nervous disease, which is likely to be, such favorable result might be sufficient to impress the learned alienists that there are more than suggestive therapeutic effects to be derived from the scientific employment of electricity.

Until the neurologists cut loose from the obsolete notions of Erb, who taught from the light derived from the employment of the crude medical batteries of his time, they will continue to obstruct progress in the relief of human suffering. Ten years has made such changes in the development of electrical apparatus that those who are treating and reasoning from their experience of prior date are a reproach to the progress of the science, and unjust to humanity, for after all, differentiation and classification of neuropathic conditions are not of more importance than the institution of measures for relieving the conditions, and it can be safely said that no other remedy has the range of usefulness in the treatment of painful, spasmodic, and all functional neuropathic conditions combined, as the high-potential electrical discharges. The truth of this statement resides in the fact that such discharges relieve pain, lessen local congestion, and induce general metabolic activity. Suggestion, least of all, is the potent influence in the treatment of such cases.

To the general practitioner who can own and successfully operate the modern apparatus, electricity is the greatest boon of the century. The scope of its application is so large and the possibilities so great, that the man in such a practice finds it invaluable in successfully treating many patients who must otherwise fall into the hands of a specialist. While the technical knowledge of all that pertains to the science of electricity is valuable to all who employ it in any sphere, commercial or professional, a small part alone of such knowledge is necessary to the physician, but the practical grasp of the great principles of application usually is not difficult of comprehension by the intelligent physician. First of all he should never buy

the apparatus he intends to employ until he knows how to use it. If this rule could be observed, medical electricity would be benefited in two ways—blunders would not bring condemnation, and the employment of efficient apparatus would obtain the best results.

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### PHYSICAL EDUCATION.

Exercise as a prophylactic against disease is of the greatest value, but the tendency of the present time is to make the necessities for labor less, and men neglect its importance until often too late they are forced to realize that a mistake has been made. Human nature is prone to be lazy and the physician recognizes the fact that, barring excesses, more disease is due to neglect of taking exercise than to other causes. Men "rust out," few "wear out." That the subject is receiving more attention is evidenced from the fact of its more general introduction into the public schools. Physical education as scientifically taught at the New York Normal School of Physical Education, at the Dr. Savage Institute in this city, is worthy of the highest commendation. The young women of the graduating class, in their recent closing exercises, are themselves an argument which speaks in loudest praise of the system employed. Endurance, health, beauty, and grace, as evidenced by each one, should induce the extension of so perfect a system. That such a school is at last established, for the purpose of teaching a correct system to those who shall instruct the young, is a source for public congratulation.

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### THE MEETING OF THE SECOND CONGRESS OF MEDICAL ELECTRICITY AND RADIOGRAPHY.

BY an unfortunate coincidence the Berne meeting falls at the same time as the meeting of the American Electro-Therapeutic Association, which will prevent some American physicians who might otherwise be present from attending. It is desirable, however, that papers marking the progress of the science in this country will be forwarded to the Congress. The notice of the meeting was published in the May number of the JOURNAL.

## Progress in Physical Therapeutics.

### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### Editor ADVANCED THERAPEUTICS:

*Sir:* I would be very glad to get your opinion regarding the following case:

A member of my own family is the patient. She is thirty-three years of age, and has been ill since the birth of the second child seven years ago. For the past four years she has been in bed more than half of the time. For the first four years following birth of child she showed symptoms of neurasthenia only, there being no signs of pelvic disease which would call for a vaginal examination, and as she was averse to it none was made. In March, 1898, she was sent to a sanitarium for a rest cure. The physician there made a vaginal examination, discovering a subinvolved uterus, which was retroflexed. His treatment, consisting in the use of sounds, glycerine, and boracic acid (contrary to my advice, as the last two always irritated the patient, wherever applied), produced a pelvic inflammation, and she came home in July with the uterus firmly bound down to the rectum, and worse in every way.

Since then has had one miscarriage at three months, in June, 1899, pregnancy having been advised as a curative measure. In July she was curetted, and since then has been treated locally by tampons and various local applications. Was worse after the curetting, the right ovary and tube being inflamed. Has been better and worse since then, but in general is losing vitality and does not respond to the action of remedies.

Present condition is a retroverted, adherent uterus, right ovary prolapsed, uterus slightly enlarged and "boggy." Considerable backache, local soreness in uterus and ovary. Occasional leucorrhœa, which is white and jelly-like and without odor.

Patient sleeps and eats well, but is exhausted. Is in bed till noon or later, and only rides out occasionally. Is prevented from taking walks, etc., by fear of attacks, which patient refers to heart, she feeling as if she were going to die. These attacks come on from either physical or mental fatigue. No one has ever detected any organic heart trouble.

The best physicians and surgeons have been consulted, but they suggest nothing but ventro-suspension, without promising cure. Patient objects to operation under these conditions, and I write to ask your opinion of mercuric diffusion or any other electrical procedure.

Until this sickness patient had always been well, though never robust, and is particularly sensitive to drug action. She is and always has been of a hypersensitive, nervous temperament. Menstruation is regular, painless, and normal in amount.

Any local treatment other than the mildest, such as douches and simple applications, has always aggravated the symptoms, as the above history shows.

I would like very much to have your opinion in the matter.  
Very truly yours,

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Reply.—It is evident that you have both neurasthenia and its pelvic cause to deal with in this case. The remedy for the local pelvic condition is unquestionably the removal of the chronic inflammation, which has its seat in the tubes and ovaries and their peritoneal covering. How could ventro-suspension possibly remedy such a condition, even granting that these organs could be torn loose from each other without great injury and further complications? Do we tear a lung loose from the chest after adhesive pleurisy, instead of endeavoring to remove inflammatory conditions, leaving the adhesions to nature?

The history of the case indicates the risk of any intrauterine treatment. The patient is already a twofold victim of unwise efforts of this nature.

We advise vagino-abdominal mercurial cataphoresis applied as follows. Procure a pigeon-egg-shaped brass electrode (a brass-ball electrode with olive about the size of a pigeon's egg, mounted on an insulated shank as depicted in the January number of *ADVANCED THERAPEUTICS*, page 32), denude the active surface of nickel by a treatment with acid, and thoroughly coat it with mercury. Place this instrument, freshly amalgamated at each application, in a fornix of the vagina, connect it with the positive pole, and with a proper dispersing pad on the abdomen, turn on from 50 to 75 milliampères for five to six minutes, thrice weekly. A few applications will cause considerable superficial erosion of the mucous membrane, which may be kept within bounds by varying the fornix from time to time. The treatment may be kept up for a month or more in average patients without additional discomfort from the local effects, but when this appears it should be changed to fine-wire faradic currents, until the mucous membrane is again ready for the cataphoric applications.

Usually the patient is better in a few weeks, in spite of additional leucorrhœa, and will ultimately be conscious of intermittent watery discharges from the tubes, while the physician attests improvement in a greater mobility of the affected organs.

We would also advise static electricity for the general condition present.

G. B.

## DISEASES OF THE ALIMENTARY CANAL

EDITED BY WALTER H. WHITE, M. D., BOSTON, MASS.

*On the Treatment of Nervous Indigestion or Gastric Neurasthenia.* Edinburgh Medical Journal, January, 1902.

George Herschell says that the diagnosis of this condition is mainly to be made by a process of exclusion. We have to exclude the presence of indigestion in a patient who has evident gastritis, ulcer, myasthenia, nor cancer, but who just as evidently is a neurasthenic. In regard to treatment, we must first make sure that the condition does not depend upon absorption into the system of toxins from the alimentary canal. If by examination we can exclude myasthenic retention, we may give the frequent small meals which are best for neurasthenia. If HCl is in excess, we must give such food-stuffs as will combine with it, yet do not greatly stimulate its secretion, and these will be sweetbreads, calves' brains, oysters, eggs, ham, men, and milk. We should give toasted bread and converted starch. For deficient HCl the author gives a diet of rice. For giving tone to the system, he recommends static electricity and the sinusoidal bath. The most valuable drug for the treatment of gastric neurasthenia he considers to be silver nitrate given in 1-2 grain doses in palatinoid form, combined with an inert vegetable powder. It acts as an astringent, diminishes abnormal irritability of the nerves of the stomach, and is a tonic to the nervous system. The author goes into detail the local treatment, which may have to be applied to the interior of the stomach.

*Intestinal Movements.* Journal of Medical Research; "The Movements of the Intestines Studied by Means of the Roentgen Rays."

Cannon has investigated the movements of the intestines with the Roentgen rays, using bismuth subnitrate mixed with food. He thinks the most notable activity of the small intestines is in the simultaneous division of the food lying in a large loop into small segments and a rhythmic repetition of this division without any notable advance of food through the tube, mixing up the food and the digestive juices and bringing them

in contact with the absorbing mechanism. Peristalsis is usually combined with segmentation. As the food is advancing, interfering constrictions often momentarily separate the rear end of the mass from the main body. The ileocæcal valve is perfectly competent to prevent the repassage of food from the colon. The usual movements of the transverse and ascending colon and the cæcum are antiperistaltic, occurring in periods about fifteen minutes apart. Thus the food in the closed sac is thoroughly mixed and again exposed to the absorbing wall without any interference with the processes in the small intestines. There is a gradual pushing, however, of the food forward. In emptying the large intestine, the material in the lower descending colon is first carried out by combined peristalsis and the pressure of the abdominal muscles. The remainder of the material is then spread into the evacuated region and this region again cleared. There is no evidence of antiperistalsis in the small intestine. Signs of emotion, such as fear, depression, or rage, are accompanied by a total cessation of the movements of both the large and small intestines. The movements continue in the cat during sleep.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

Surgical Notes in Cairo, Egypt, appeared in the Medical Age, Detroit, Mich., March 10, by Hal C. Wyman. The paper treats of stone in the bladder, hematuria, chyluria, etc.

The Journal of Cutaneous and Genito-Urinary Diseases, New York, for March, contains two articles of interest: (1) Relative Impotency Due to Chronic Urethritis of the Posterior Urethra. By Louis E. Schmidt. The special form of impotence described by Schmidt is where the sexual feelings are changed to a most painful condition and their excitation avoided. The local findings are enlargement and redness of the caput gallinaginis, inflammatory signs in the verumontanum and other evidences of chronic posterior urethral inflammation. The urethra should be treated by direct application of iodoglycerin solution to the parts, at first weak, afterwards increased in strength, using less quantity and less frequent applications.

(2) New Tissue Formation in the Urethra. Its Early Detection and Permanent Obliteration. By J. Henry Dowd. The following are the conclusions of Dowd's article: "The stringy substance found in the urine during the early period of resolution (three to eight weeks) must not be confounded with the true shreds (three months and on), which are evidence of

localized inflammation. The bloody, clot-like string so often seen after dilatation of the urethra, due to contracted meatus, close navicular valve and the like, must not be confounded with the true bloody string, which consists of pus, degenerated epithelium, mucus, and blood-cells imbedded in a hyaline matrix. An antiseptic solution should always be used for flushing the canal previous to the instrumentation, and afterward an astringent should be used in the same way, this not only for allaying irritation, but for flushing out the evidences of new tissue formation. For diagnostic purposes, the constriction must be stretched above the diameter that already exists and for prognosis, at least two numbers above the normal circular caliber."

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*The Surgical Treatment of Sterility Due to Obstruction at the Epididymis, together with a Study of the Morphology of Human Spermatozoa.* By Edward Martin J. Berton Carisett, J. Valentine Levy, and M. E. Pennington, University of Pennsylvania Medical Bulletin (Philadelphia).

This article by four authors reviews the microscopic characters and the morphology of spermatozoa, and gives experimental studies and clinical observations of their vitality. The conclusions, which they consider to be fully determined by their study of the subject, are; "In sterile marriages the fault certainly lies with the husband in from ten to fifteen per cent. of cases; probably in a still larger percentage. Though absence of motile spermatozoa is a proof of sterility, their presence does not necessarily demonstrate that the semen is fertile. Microscopic study shows that spermatozoa, although they are alike in general characteristics, differ greatly, even in the same individual, in conformation, size, and color reaction. In spite of these differences, it seems possible to recognize the normal and probably fertile organisms. In their passage through the epididymis the spermatozoa undergo developmental changes so marked as to be easily recognizable; hence, it is probable that the epididymis is not a mere conduit. The prolongation of motility is a better index of fertility than the mere fact of motility. The commonest local cause of sterility in the male is obliterating bilateral epididymitis of urethral origin. Bilateral epididymitis is comparatively rare. Permanent obliteration of the tube of the epididymis is its exceptional rather than its usual termination, and is most effectually avoided by prolonged treatment. When the obliteration persists it is in the tail of the epididymis. Azoospermia resulting from obliteration in the tail of the epididymis can be easily and safely overcome by forming an anastomosis between the head or body of the epididymis and the vas. Ejaculations following this anastomosis swarm with motile spermatozoa.

Whether these be fertile and whether the vaso-epididymal anastomosis will persist, can be determined only by prolonged observation." An extensive bibliography is appended to the paper.

Experimental Suprarenal Diabetes. L. Metzger Frankfurt. M. Münchener Medical Wochenschrift, March 25. In Metzger's experiments injection of suprarenal extract induced hyperglycemia in dogs and rabbits. Whether the action was by the mediation of the pancreas or of the liver is still undetermined, but indications point to the latter. The injected substance seems to act on the pancreas and inhibit the functioning of the cells of the organ. The largest proportion of sugar was observed in rabbits injected immediately after both kidneys had been ablated.

Ichthargan in Treatment of Gonorrhea. E. Saalfeld, Berlin.

Ibid. B. Goldberg, Therapeutische Monatshefte, Berlin, March.

X-Rays in Diagnosis of Stones in Kidney or Urinary Passages. J. Mygge. Roentgen Anvendebre till Raavisning at Sten Nyo eg Urinlederne Hospitalstidende, Copenhagen, February 19 to March 19.

Prophylaxis of Venereal Diseases. P. J. Wising and others, Hygica, Stockholm, January to March.

A Consideration of the Bottini Operation with Report of Cases. By Georg Walker, Maryland Medical Journal, Baltimore, for April. A New Combined Electro-Cautery Incisor for the Bottini Operation, for Prostatic Obstruction. By Hugh H. Young, Ibid.

The Nature of Prostatic Hypertrophy is the title of a long original article by Robert Holmes Greene and Harlow Brooks in the Journal of the American Medical Association, April 26. This is the combined good work with microscopic illustrations of a series of fifty-eight cases, and closes with the following conclusions:

(1) Prostatic hypertrophy of the aged is the result of chronic prostatitis.

(2) It most frequently arises from chronic posterior urethritis of whatever cause.

(3) True neoplasms of the prostate are rare, and are not concerned in the production of prostatic hypertrophy.

(4) Carcinoma is apt to occur in the hypertrophied prostate as a result of the chronic inflammatory process.

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*Vibrating Urethral Sound.* Lankowski, Berlin. Die Vibrirsonde, Deutsche Medical Wochenschrift, Leipzig, April 3.

The writer attributes the beneficial effects of the sound in urethral affections to the massage which it induces. He has

succeeded in materially increasing the amount of massage by constructing a sound on the principle of vibration instruments. After numerous trials of various devices, he recommends a large metal sound fitted into the rolled end of a wide metal spring, wider and stronger than a watch spring. The end of the spring holding the sound is screwed flat between two narrow metal plates fastened together with two thumbscrews and nuts. The sound is inserted in the urethra and slight blows are struck on the projecting coil of the spring with a padded mallet. The vibration thus induced is not disagreeable, and is not followed by any inconveniences. It can be repeated every second or third day, or even daily, if necessary. The sound used is as large as can be introduced without pain, as the walls of the urethra respond better to the vibration when they are stretched. The effect was favorable in cases of over-stimulation as well as in those of relaxation. Abnormal sensations in the urethra were banished. Incontinence of non-central origin was cured, and the effect was most excellent, or at least satisfactory in all cases of sexual neurasthenia, phosphaturia, and prostatorrhea. Recent inflammation and the presence of gonococci are contra-indications. At first the suppuration and filaments seem to increase, but this is merely the cleansing effect of the procedure, and is soon followed by thinner secretions and decreasing numbers of filaments.

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### LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D., NEW ORLEANS, LA.

#### *The Application of Heat in the Treatment of Ear Diseases.*

Heat is a useful therapeutic agent in diseases of the ear, and one whose value has long been recognized. In the early stage of acute inflammation of the middle ear, by promoting the local circulation and causing absorption of inflammatory deposits, it will frequently abort the process. Even when this is not the case, it is one of the most useful agents for allaying the violent pain incident to inflammation of the middle ear, and this is soon appreciated by the suffering patient.

The ordinary methods of applying heat are, externally, by means of the hot-water bag, properly covered with a woolen cloth to prevent too rapid transmission of the heat,—Leiter's coil,—or directly into the auricular canal by means of a hot solution of boracic acid, or of the normal saline solution. The first method is more applicable for the mild cases and the latter for the most severe, as the heat is transmitted deeper into the ear and nearer to the seat of the inflammation.

In using the solutions, the temperature should be as high as can be well borne by the patient—about 110° F.; the reservoir, as for instance the fountain-syringe bag by means of which these applications are usually made in the household, should be held only high enough to insure an even flow of the solution, too great a pressure being injurious. The ear nozzle should be so held that, while the stream passes directly into the canal of the ear, it can return freely so as to avoid undue pressure on the ear drum.

In cases in which the pain is severe both methods may be used, the ear being irrigated every hour or oftener, and, in the interim, the hot-water bag being applied.

It must be understood, of course, that these methods are only auxiliary to the special treatment required in the case, and should not interfere with other treatment that may be required to save the delicate organism of the aural apparatus, as, for instance, paracentesis of the drum, to relieve the intratympanic pressure and its injurious effects.

In addition to these methods of applying heat, there has more recently been advocated the application of heated air, which, while not as convenient for application, offers the facility of utilizing a greater heat than could be applied, or could be tolerated, with the above methods. Nor has this method been limited to acute inflammatory processes, but even and more especially to the chronic forms of catarrhal inflammation of the middle ear.

The recent success in the application of superheated air in the treatment of obstinate affections of the joints has encouraged the use of similar methods in chronic diseases of the ear, in which the involvement of the articulations of the ossicles play a prominent part. The greater difficulty in the application has naturally interfered somewhat with the results obtained, but this has been partly overcome by special modifications of the apparatus for applying the heat, and at the same time of using compressed air for its transmission. Dr. George W. Hopkins has described (*Annals of Otology, Rhinology, and Laryngology*, February, 1902), three forms of these heaters, one operated by alcohol, the second by gas, and the third by electricity, with which he has obtained some excellent results in cases of chronic catarrhal inflammation of the middle ear.

The technique of the application is as follows: The ear selected for treatment is carefully examined, and should be perfectly clean and dry. A light pad of gauze (two thicknesses) is placed over the ear, and with an ear speculum the gauze is pressed deeply into the canal. The ear-tip of the heater is then carried well into the canal, leaving only room enough between the tip and the tympanum for the escape of the used air.

The electricity is then turned on, or the gas ignited (as the case may be), and the compressed air is admitted to the cylinder under about five pounds pressure. It is well to give a ten- or fifteen-minute séance, increasing the temperature gradually until the limit of toleration is reached. The temperature steadily increases until the heater reaches its generating limit at that air-pressure, and if the patient tolerates the temperature well it may be further increased by raising the air pressure to seven, eight, or even ten pounds in most cases. One cannot be guided by thermometers in giving these treatments, and hence they are not employed on the new heater described. The only guide which can safely be followed is the individual toleration of the patient. But it is well to remember that the more slowly the temperature is raised the higher temperature the patient can endure without discomfort.

Antiseptic washes must be used. All abnormal conditions must be rationally treated. Constitutional measures, when indicated, must not be neglected. Inflation of the eustachian tube with a warm, stimulating vapor from a good nebulizer is usually imperative.

It is well to practice eustachian inflation and vibratory massage of the middle ear with medicated vapor from the nebulizer after each hot-air treatment, being particular that the vapor is warm. A warm vapor is easily secured by connecting the compressed air heater in service with the nebulizer, sending the compressed air first through the heater and then through the nebulizer.

As the result of his experience with this method of applying superheated compressed air in chronic catarrhal otitis media, Dr. Hopkins offers the following conclusions:

As an exclusive treatment it is rarely of much value in greatly advanced cases, but when indicated and judiciously employed, in conjunction with other measures of recognized value, it will give results which would be utterly impossible without its aid. When employed with care it is absolutely safe unless contra-indicated. It is of little value in old subjects, who have extensive labyrinthine involvement. It stimulates absorption of articular deposits, removes atrophy, and relieves rigidity of the tensor tympani.

It acts more favorably on the ossicular chain than on many other articulations, because of their exceptional proximity to the surface. Arterio-sclerosis, serous effusions into the tympanum, and perforations of the tympanum are usually contra-indications, and always contra-indications to the inexperienced operator.

## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

### *Treatment of Cancer with the X-Ray.*

Probably no subject is attracting so much professional attention at the present time as the X-ray in cancer, and undoubtedly, very many things are happening which are unaccountable from the present standpoint of observation. It is a noticeable fact that in all cases of deep cancerous growth a marked reaction is induced by the first few exposures, and in other cases a frequent rise of temperature will be noted. This may be accounted for in some cases from possible sloughing that may take place in the alimentary tract, as is noticed in thick cancerous growths upon the surface and in the mouth when sloughing is in progress. Sloughing was observed as a result of exposure to a sarcoma involving the buccal cavity, and in cancer of the larynx involving the vocal cords which was rayed from the surface and not directed upon the mucous or ulcerating surface. During the sloughing there was well-marked rise of temperature for a few days in the sarcoma of the face.

The following case, though marked by a fatal termination, showed remarkable features deserving of consideration.

M. C., aged fifty-five, cancer of stomach, diagnosis confirmed. Patient was in a critical condition when treatment was instituted. Nausea and frequent vomiting of blood and discharges having a very offensive odor, and constant eructations of gas. The patient had frequent attacks of dyspnoea. On the day preceding the first raying rectal alimentation had been necessary for the first time. A tumor, indurated, five inches in length by three and one half inches in width, could be distinctly mapped out at the pyloric end of the stomach. Cachexia was not well marked, which afforded the only encouragement. The family were anxious and the treatment was undertaken with the following results:

A ten-plate static machine was placed in the apartment, and a tube which would back a ten-inch spark-gap was used from the first. Exposures were made for fifteen minutes every thirty-six hours,

March 1, Second raying.—Patient was found with distinct reaction—very weak, enemata retained.

Third raying.—Patient very feeble, had vomited seven times

during previous night, aggregating one pint of blood, ejecta not so offensive as on previous day—dyspnea with nausea, flatulence, and hiccoughs continues—all fluid taken is promptly ejected—rectal enemata retained. Examination shows the margins of the tumor distinctly softening.

Fourth Raying.—Patient's condition is much improved, hemorrhages have ceased, has vomited but once in thirty-six hours at which time there was no odor present, nausea and hiccoughs have ceased, and dyspnoea not so marked. The tumor had perceptibly softened over the whole extent.

Fifth raying.—Patient distinctly improved; nausea and vomiting have ceased and considerable water has been taken—pulse 100 and regular, and no dyspnoea. Tumor softened over whole extent.

Sixth raying.—All symptoms favorable but pulse, which is 110, and temperature, which just preceding the treatment was 96 2-5° F.; immediately following, temperature 97 2-5°. Has taken eight ounces of trophonine during past twenty-four hours, by the mouth. No nausea, vomiting, or hemorrhage, patient is very weak.

March 8. Report by telephone: pulse 112; temperature normal, taking peptonized milk; no nausea or vomiting.

March 9. Found patient too weak to consider treatment, pulse 130, temperature 104°. Patient died a few hours later. While the termination of this case was death, the results were so remarkable that they are suggestive. It is doubtful whether the immediate cause of death was from exhaustion or auto-infection.

A case in which rapid sloughing was taking place from a large elevated cancer of the face—a patient eighty-seven years of age, progressed satisfactorily for six weeks when, twenty-four hours after the last raying, the patient was seized with a severe chill, accompanied by a high fever and great prostration. Rallying after two weeks, the tumor continued to diminish rapidly after discontinuance of treatment. That auto-infection in a person of great age caused this marked reaction there can be no doubt. That she is recovering, and, though raying has been discontinued for one month, the cancer continues to diminish in size, is instructive.

In another case an epithelial cancer of twenty-two years' growth, covering a considerable area, was treated for six weeks. Eight X-ray exposures in all were made of fifteen minutes each, with low tubes, followed for the balance of the time by the static brush discharge from the wooden-ball electrode. The results in the last two indicate that many cases may be rayed more than is necessary, and probably if those which do not seem to heal under constant raying were treated by the brush discharge they would be promptly cured.—[EDITOR].

*The X-Ray in Tuberculosis.* By Wm. H. Dieffenbach, M. D., in the N. A. Journal of Homeopathy.

The writer reports two interesting experiments: (1) Decomposed urine, swarming with micro-organisms, was placed in a small vessel and exposed to the X-ray for half an hour with absolute destruction of bacterial life. (2) A fresh typhoid culture was exposed for an hour, following which microscopic examination showed absolute immobility, and a second culture, attempted from the first, proved unsuccessful. Experiments with the tubercle bacilli did not show the same satisfactory results. In lupus vulgaris and several cases of tinea the anticipated success in treatment was rapidly confirmed, but the use of the X-rays in pulmonary tuberculosis required a longer period of trial and was given on a purely experimental basis, as the action of the rays, when penetrating living tissue, has not been determined. Two cases are reported in which the treatment combined the use of the X-ray, static administrations, sponge bathing, and general hygienic treatment.

The patients were both in the second stage, and both made satisfactory improvement under the mixed treatment, and the writer was certain that the X-ray contributed.

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Cordón E. Rogers, M. D., Seattle, Washington, in the Medical Century of December 11, 1901, has a very interesting article on the "Therapeutic Action of Light."

He takes the position that the bacillus pneumococcus is the easiest germ to destroy by means of the therapeutic effect of light, and thus by actual experiment pneumonia is quickly and easily cured in early cases by one exposure to the influence of concentrated light.

In the secondary class he places the animal parasites infecting the alimentary canal, ascaris lumbricoides and ascaris vermiciformis, both capable of destruction by a single application.

Tuberculosis is placed in the third group, and the doctor is confident of the destruction and annihilation of the bacilli, although many advanced cases will not be able to recover on account of the tissue lost.

The writer believes that the general condition of the patient has more to do in making up the prognosis than any symptom discoverable in the lung. He thinks in all early cases we can truthfully promise speedy and permanent cures in one to two months.

In the fourth class he places cancer, and the improvements in these cases seem to be very much like the symptoms reported of the X-ray work—immediate cessation of pain and rapid return to function of organs involved.

The paper is an admirable one and we regret that the writer

did not tell us more of the kind of light he used: what form of lamp voltage and amperage was required, etc. There are now so many forms of light apparatus that it is essential for us to know what form of apparatus we are dealing with, in order to form any conception of the light produced.

"The Dermo" is a new electric lamp that is likely to do much towards revolutionizing the light therapeutics of to-day.

It was discovered by Mr. Kjeldsen that iron, when used as an electrode, gave a light very rich in chemic rays and almost devoid of heat rays. He has constructed a Fensen lamp the electrodes of which are made of hollow pieces of iron, kept constantly cool by circulating water. It is said this lamp gives the effect in two minutes of an hour's application of the old Fensen lamp. It is so constructed that it does not require the constant attention of a nurse as was necessary with the old lamp; the apparatus is much cheaper in many ways, and it seems that something definite has been accomplished in this line of work and its development will be watched with very great interest.

J. D. G.

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## DERMATOLOGY.

EDITED BY ALBERT C. GEYSER, M. D., NEW YORK.

THE discovery of the Roentgen and the Actinic or Finsen's rays has been met with favor by all eminent dermatologists and hailed as a new era of rational and effective therapeutic procedure. They are now being employed exclusively at the expense of the so-called antiseptic agents. The galvano-cautery may also be used in rebellious forms of lupus, but its applicability, since the introduction of the Roentgen's and Finsen's light is rather limited. It savors of barbarism, as compared to the less painful and more efficient effects of the ray treatment. Painstaking efforts should be made to have the diseased surface properly and thoroughly exposed to the penetrating action of the rays, lest the result be evanescent and far from satisfactory. Two exposures weekly, for a time, suffice as initiative, after which the sittings may take place more often.

Local antiseptic medication should not be altogether slighted or discarded, as it forms a valuable adjuvant to the ray treatment. Ointments or lotions of mercuric bichloride, 1 in 8000 or 10,000, or the ointment of hydrarg. ammon. of five per cent. strength; iodoform or iodine in ointment or solution; phenol in the same form; hydrogen dioxide or hydrozone, ichthyol,

ethyl chloride, salicylic and benzoic acids in any convenient form; cinnamic acid or the essential oil of cassia in alcoholic solution or ointment, or a combination of several of these remedies, are important auxiliaries. The actual cautery curettement and cauterization of the lesions with the various escharotics, notably caustic soda and potash, argentic nitrate or chromic acid should never be undertaken. The loss of tissue incurred by their employment, the deformity following, and the pain accompanying their application do not warrant their introduction as routine measures. As long as we possess the X-rays and Finsen's light, we should keep ourselves at a distance and aloof from the application of these destructive means.

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*Ultra-Violet Light from a Rapid Oscillation High-Tension Arc  
in the Treatment of Skin Diseases.* Med. Record.

Hugh Walsam describes and figures the apparatus he has used. He has applied the remedy to cases of lupus vulgaris and l. erythematosus. The former do better than the latter. The time of exposure has been from ten to fifteen minutes. Special stress is laid on compression. Cases in which this can be efficiently applied (as, for example, lupus on the end of the nose) improve much quicker than cases in which the compression is more difficult. At the present time it is somewhat hard to tell whether a given case of lupus will do better with the X-rays or the ultra-violet rays. Many observers appear to regard the treatment by X-rays and by light as something quite different. When we consider, however, in how many ways ultra-violet and the X-rays are alike, the distinction between the two almost vanishes. Both act chemically, both produce fluorescence in bodies, both discharge the gold-leaf electroscope. The action on the skin is, however, somewhat different, although they are both capable of producing dermatitis and pigmentation. In the case of the light treatment, dermatitis supervenes after some hours, whereas with X-rays it may require even weeks to produce it. Again, the dermatitis produced by the ultra-violet rays soon resolves, but it is well known that the X-ray form may take weeks, or even months, to heal. It is true that X-rays have more penetration, but in passing through a body they generate secondary rays, which have a great analogy to ultra-violet rays. It is probable that secondary rays are Roentgen rays very slightly penetrative, and possibly intermediate between the rays from a soft tube and extreme ultra-violet rays. There is, according to current belief, a great difference in their action on bacteria, the X-rays being said to stimulate their growth, while the violet and ultra-violet rays are known to kill. In fact, we may say that the only

absolutely sure ground on which we may build is that the ultra-violet rays will kill bacteria outside the body. Other observers are treating cases of lupus with the static breeze and the Tesla condensing electrode. The Tesla electrodes have been used with success in the department, and it appears to me in all these various methods of treatment that the only one point they possess in common is the ultra-violet ray. It has been found that all materials used as compressors or heat arresters obstruct many of the bactericidal rays. Ice, however, has so many advantages, both from a theoretical and practical point of view, that it has been adopted in nearly all cases. These advantages are so important that it may be well to enumerate them: (1) It is hard enough to cause efficient pressure; (2) It adds to this effect by increasing the anaemia by cold; (3) By its transparency it allows the individual lupus nodules to be clearly seen; and (4) It is transparent to the violet and ultra-violet rays of the spectrum and opaque to the red and infra-red.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

*Radiographs Showing the Results of an Elbow-Joint Resection.*

Taken and reported by Wm. J. McKown, M. D., of Albany, N. Y.

History of case.—W. G., coachman, aged forty. Joint was fractured and dislocated by fall downstairs. He was first admitted to the Albany County Homeopathic Hospital about two months after the accident, and at that time had an absolutely stiff elbow. At the request of Dr. E. G. Cox the first radiograph was made, and a resection was then decided upon. The operation was performed by Drs. E. G. Cox and A. B. Van Loon, and the second radiograph was made about two weeks later. It is now about two months since the operation and the patient has a very useful joint, being able to move the fore arm with perfect ease.

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## CONSTITUTIONAL DISEASES.

EDITED BY FRANCIS B. BISHOP, M. D., WASHINGTON, D. C.

*Static Electricity in the Treatment of Insanity.* By Robert Howland Chase, M. D., of Philadelphia; Superintendent of the Friends' Asylum for the Insane, Frankford, Philadelphia. From the Philadelphia Medical Journal, May 3, 1902.

The writer first considers the status of static electricity in the past and its growth in use of late. "Static electro-

therapeutics has now fully established its worth, and each year sees many physicians adding static machines to their armamentarium. No sanitarium of to-day would be regarded as efficiently equipped without such appointment, and the number of asylums and hospitals that are entering the list is increasing constantly. . . In late years asylum physicians have adopted in the treatment of the insane electricity, baths, massage, and rest cure, so-called accessories. Static electricity thus finds a useful field among certain classes of cases in our insane asylums, to which its health-giving properties may be administered beneficially. It affects the mind through the body. At Friends' Asylum static electricity has been applied in selected cases for some years, and while it may not have been always successful in affording relief, the general trend of treatment has been efficacious. In our hands it has been joined with other remedial measures, so that it is difficult to estimate with precision its own immediate influence upon mental improvement and cure. In a few instances its restorative action seemed but little short of the miraculous."

"In our experience the neurasthenic forms of mental ailment, such as the melancholias, are the ones in which expectation may be most fully realized. We have used the 'breeze' in the largest series of cases, although the 'spark,' directed to the spine or to various parts of the viscera, is most potent when used with skill. Dr. P. M. Wise, while Superintendent of the St. Lawrence State Hospital for the Insane, reported a number of cases, in which little hope of recovery was held, that recovered afterwards upon prolonged treatment by static electricity alone; and he came to the conclusion that in many cases of insanity, especially in all forms of chronic mental depression, even when recovery seemed hopeless, there was good prospect of restoration to health, or to a condition of comparative comfort and usefulness, by the application of this therapeutic measure. . . It is not expected, of course, that static electricity will perform wonders where organic lesions have hopelessly impaired function, but its beneficial effects are usually found in the acute mental disorders, in restoring a balance to the system, in smoothing away the restlessness, the insomnia, the melancholia, and reinvigorating tone of both mind and body."

The suggestive effect of static electricity and its facility of use are noted. The report of a case of delusional melancholia successfully treated by static electricity concludes the article.

Dr. G. Betton Massey of Philadelphia, in the January number of the Therapeutical Monthly, contributes his valuable experience in the use of "Static Electricity in the Diagnosis and Treatment of Hysterical Affections." Dr. Massey says, "I know of no definite facts that have been developed of more

importance than certain discoveries relating to the value of static electricity in the diagnosis of hysteria and rheumatism." These observations simply corroborate the observations of the late Dr. Apostoli, and coming, as they do, from two such careful investigators, must of necessity attract more than a passing notice.

Dr. Massey says, "As a result of clinical experience Apostoli points out that the hysterical subject presents a very high tolerance of the painful form of static electricity. Sparks that give great pain to normal individuals are borne uncomplainingly by the subjects of hysteria, and, at times, even relished by them. As this tolerance of the static spark is not encountered in neurasthenic persons, who, indeed, are usually most intolerant of this form of treatment, the value of this clinical test in differentiating between hysteria and neurasthenia is most evident, particularly in those border-land cases in which other distinguishing features are absent."

"I have been able to verify these statements in quite a number of cases, many of which showed toleration in all portions of the skin surface without any special areas of anaesthesia. I do not doubt, however, that its source is the more or less general analgesia which these patients suffer from. Whether the test is to be relied on in all cases I do not know. . . It is most interesting to note, also, that, as the hysterical subject improves under static applications and other appropriate treatment, the tolerance lessens, until finally only that found in the normal individual exists."

The doctor speaks in the highest terms of the great value of the static spray and spark in the treatment of hysterical cases and says, "Whether this be due to suggestion, to the arousing of sluggish neuronic condition, or changed vaso-motor conditions, it is often impossible to decide."

He speaks of several cases of his own—where the excretory glands of the skin failed to functionate for several years,—even in very warm weather. These were stimulated to action by the static currents,—and he says that the action of the current "is often so pronounced as to leave no doubt that the changes observed are due to something more physical than expectancy."

"It is most unlikely, however, that the action of static electricity, as produced by the modern powerful machines of American make, is confined to this reflex rôle, important as it may be. That it has profound, probably local and polar, actions on tissue metamorphosis is evidenced by certain contrasting effects produced by it in rheumatism." The doctor gives several interesting cases of hysteria, where the heavy sparks were received not only without complaint, but with apparent pleasure, and in each instance, with curative effect.

As important as this diagnostic indication may be, it can-

not be accepted, as a settled fact, that the static spark will, in every instance, differentiate between hysteria and other nervous conditions, and especially neurasthenia. It has been within my experience to treat hysterical cases in which there could be but little doubt as to the diagnosis, where the skin seemed to be in an exceedingly hypersensitive condition, and even a heavy brush discharge elicited the most vigorous complaints from the patient. On the other hand, I have met with just such patients as the doctor mentions, I have two of them coalescing at the present time, who formerly really enjoyed the spark, but are now beginning to complain bitterly of even a less severe treatment. Dr. Massey, with his able pen, has revived an axiom of our departed friend Apostoli, which may lead to careful investigation on these lines, and can tend only to a more scientific use of this valuable therapeutic agent; but in our investigations we must not forget that there is no normal standard of toleration of the static spark, even in health. Some people will stand a much heavier spark than will others. It has also been within my experience that while some people (not hysterical) will, after taking the spark treatment for a while, become more susceptible to its painful effects, others seem to acquire a tolerance for the spark to such a degree that they appear to like it. These facts are not stated in criticism of Dr. Massey's valuable paper, but simply to increase its value by showing the possibility of error in trusting to this means of diagnosis alone, which may lead us astray if the cases are not well selected.

In the diagnosis of rheumatism, the doctor says that "If the subject of a rheumatic infection, who has so far progressed as to be no longer capable of responding favorably to the salicylates or other internal remedies, is placed under the combined spray and spark treatment, he will be immediately and progressively relieved by the application. . . If, on the contrary, the case is still semi-acute, the patient is surely plunged into an acute attack by such an application. I have verified this latter act unwittingly in at least a half dozen cases, some of them repeated with the same effect as a test."

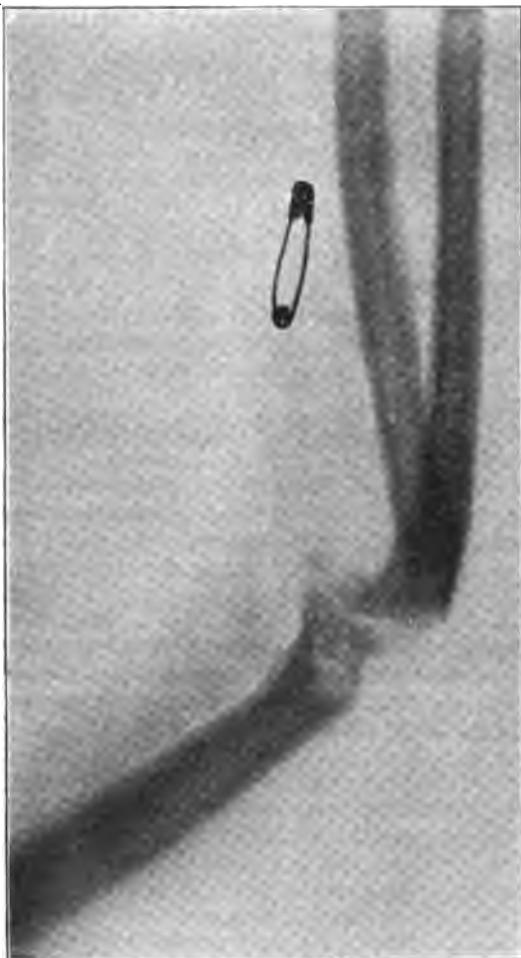
These are very interesting facts, and well worth knowing, and prove Dr. Massey to be a careful and painstaking investigator. I have never used the spark or spray in acute or sub-acute inflammations, of any kind, but have used with great benefit a very fine vibratory current of exceedingly high tension, applied by means of a wet sponge, pad, or tin foil.

We hope to hear further from Dr. Massey upon these subjects, and hope also that others may fall in line. The field is large, and work is plentiful.

F. B. B.



**History of Radiograph:** Taken with Van Houten & Ten Broeck eight-plate Static Machine. Monell tube, soft. Distance from tube to plate, twelve inches. Exposure, three minutes. Plate, Leech. Developer, Pyro-Soda. Paper, Velox.



**History of Radiograph:** Taken with Van Houten & Ten Broeck eight-plate  
Static Machine. Tube, Monell, soft. Distance from object, 12 inches.  
Exposure, four minutes. Plate, Cramer. Developer, Pyro-Soda. Paper,  
Velox.

## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

*Frey's Hot-Air Douche Treatment.* American Medicine, December 21, 1901.

Belzer reports fifteen cases in which he has used the above method with the most beneficial results. The cases were for the most part neuralgic or rheumatic in character, although scleroderma, tabes dorsalis, and oedema were also successfully treated. The apparatus is so constructed that a stream of dry hot air ( $120^{\circ}$ - $150^{\circ}$  C.) is projected on to any area desired. The result is, first, a momentary paling of the skin, followed by active hyperæmia, sweating, and a sensation of great heat. Applications should be continued for from fifteen to twenty-five minutes, and may be combined with cold-air douches, massage, different kinds of baths, etc. Belzer claims that the treatment incites cell-activity, and hence general metabolism.

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*Report of Cases Treated with Superheated Dry Air.* Canadian Journal of Medicine and Surgery.

Dr. W. H. Pepler of Toronto introduced this subject in a paper which cited his experience and observations in the treatment of certain cases by this plan or process. He briefly described the apparatus and the method of treatment. It only takes twenty minutes to reach a heat of  $300^{\circ}$  F. The average duration of the application of the heat is forty-five minutes. The physiological and therapeutical effects noticed were referred to, as dilatation of blood vessels, etc. He administers the treatment one hour after meal time, with due regard that there shall be as little excitement and exertion as possible. He has not seen any ill effects from the treatment. He first gave notes of the case of a patient, a man aged thirty-five, who had suffered for some time with varicose ulcer of the right leg, with considerable pain. This patient had a treatment of thirty-five minutes' duration, and was able to walk home with very little discomfort. After three times, in ten days, the ulcer was very much reduced in size. The second was a patient, twenty-two years of age, who had been troubled with rheumatism for two years past. A temperature of  $320^{\circ}$  was employed with good satisfaction. Several other cases of rheumatism and eczema were reported. The treatment in each case proved highly satisfactory, patients never complaining of any discomfort, and all expressing satisfaction with the treatment. Dr. Pepler subjects a considerable portion of the patient's body to a temperature from  $280$  to  $320^{\circ}$  F. The results are often not apparent for some time after treatment.

Dr. McAdam of Battleford asked Dr. Pepler if he had ever

tried the treatment with high temperature where he had any doubts of the condition of the heart.

Dr. MacDonald of Brandon referred to a case which had come under his observation, in which there was heart trouble. Perspiration occurred freely, but with no effect in a depressing way upon the circulation. Treatment in this case was continued for two weeks, but he had never determined that there had been any effect upon the heart, although there was a small heart-lesion at the time.

Dr. Pepler, in reply: He could not speak personally as to any deleterious results from weak heart. Of course, there were many cases reported where heart trouble was present. He personally had never noticed any heart or head symptoms in his cases. He thought, with care, there would be no bad results.

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## CLINICAL BACTERIOLOGY AND MICROSCOPY.

EDITED BY ARCHIBALD M'NEIL, M. D., NEW HAVEN, CONN.

THE question as to whether human and bovine tuberculosis are identical seems to have made an altogether unnecessary stir, and the articles in the lay press cannot have failed to have a pernicious effect on the general public.

There are many people having commercial interests which make them willing to believe, and anxious to spread the opinion, that bovine tuberculosis is not transmissible to mankind, and Koch's premature statement to that effect seems to have been entirely unwarranted.

This is a matter to be settled by scientists beyond dispute before vigilance is relaxed in the slightest degree, and as far as the use of milk and beef from tubercular cattle is concerned, bovine tuberculosis should be regarded as readily communicable to the human race until we have positive evidence to the contrary.

The following interesting and conservative article appeared in the editorial column of the May number of the Alkaloidal Clinic:

### *Transmitting Tuberculosis.*

When Koch expressed the belief in London last summer that tuberculosis could not be communicated from man to beast or from beast to man, the utterance was received with some skepticism. The contrary opinion, for which the eminent

German bacteriologist was himself largely responsible, had been widely, though not universally, entertained, and it was difficult for the world to adopt his later convictions unreservedly and at once. Indeed, Koch pronounced his own recent experiments inadequate and hoped that other scientists would repeat them. He did not expect the public to regard his statements as final. Those who were inclined to differ from him also found that there was no overwhelming amount of evidence to support their views, although they were not entirely devoid of such material. One of the most important consequences of the London congress, therefore, was the stimulus given to the study of the transmissibility of what is probably the most dreaded, if not the most fatal, of human diseases.

Within the last six or eight months a number of experiments have been made on both sides of the Atlantic for the purpose of testing the soundness of Koch's later theories. None of them, however, was conducted on as large a scale as those about to be undertaken by a royal commission in England. Not only in this respect, but in others also, the British tests are being initiated under the most favorable auspices. The president of the commission, Sir Michael Foster, is a physiologist of world-wide reputation, while one of his associates is one of the highest authorities on the diseases of animals to be found in the United Kingdom. Two large model farms in Essex have been placed at the disposal of these experts by Sir James Blyth, and his stables are now being prepared for occupation by the cattle with which the experiments will be carried on. Plans have been matured for attempting to convey disease to the animals in a variety of ways, and the results will be closely watched.

It is intimated that the work may extend through a period of five years. Evidently it is to be performed in no hasty or superficial fashion. Such deliberation and thoroughness may delay a conclusion, but they will give the investigation all the more value.

It has been shown that, while the inoculation of cattle with laboratory cultures of human bacilli has apparently produced little effect, disease was transmitted when sputum was employed. In other words, natural infection worked better than artificial. Again, the germs appear to be more mischievous when introduced into the blood than when put into an animal's food.

Of the bad effect of milk from infected animals, he thinks there are several well-authenticated instances. These, however, are few in number, and the milk always came from a cow in an advanced stage of disease. While, therefore, it may eventually be proved that the danger has been overestimated, there is some reason for maintaining a suspicious attitude toward the milk from infected cattle.

**THERAPEUTIC EXERCISE.**

EDITED BY WATSON L. SAVAGE, M. D., NEW YORK.

In this age of rapid advance in the methods of treating disease, as well as of a greatly increased number of agents at the command of the physician who keeps abreast of the times, there are few remedies, if any, more often recommended than exercise. Of course this does not apply to acute disease until the advanced convalescent period. Exercise, however, has a much wider field in the hands of the physician than as merely a curative agent, namely, in prevention; not as a general order, but in the direct and intelligent application to impending disorders and deformities. This state of things in this country is largely a matter of development comparatively recent, that is, within the experience of the present generation, and, from the present outlook and general expectation, the future generations will make the necessity of exercise even greater. As the population is rapidly centering in the cities, where the children are confined in narrow limits, there is consequent reduced opportunity for natural, vigorous activity necessary for a strong, healthy body. Science has so advanced methods that normal labor is rapidly being reduced. Elevators and cars everywhere take from us even the moderate exercise of walking and the more vigorous one of stair-climbing, the last of which, in times past, has preserved the city man's power of heart and opened up his lungs at least two or three times a day.

Together with this decrease of physical exertion, there has been a correspondingly rapid increase in the demands made upon the brain and nervous system, which directly both sap the strength of the growing child and the busy man, and also reduce the power of assimilation and reconstruction. If this is not burning the candle at both ends, it seems hard to find a better example. Under these conditions, exercise of a more or less artificial nature must come in and is an absolute necessity. This side of exercise, namely the general, is being rapidly provided for by the schools, clubs, and Y. M. C. A., while the normal schools are sending out qualified instructors as fast as possible, to such an extent that, before many years, we hope to see all our schools in the hands of normal and specially trained teachers of physical exercise and the day of the acrobat and circus man and makeshift, nothing-else-to-do woman teacher a thing of the past.

The other side of exercise—namely, the medical or therapeutic—must remain in the hands of the medical profession, and of those specially trained, until the day shall come when proper instruction can be given in our medical schools. To repeat: most all city physicians of large practice recommend

exercise every day of their lives to some of their patients, but should they be asked a definite prescription, not one in a hundred could give it intelligently. Exercise in a general way we all admit is a good thing, and a large per cent. of cases will profit by it in almost any form; just so, unskillful doctors will get a large per cent. of recoveries, but when the definite case does come, the result depends entirely upon the proper application and dosage of exercise. To cite an example: Dr. A. sends his daughter (who needs exercise) to a well-known strong man; with him she works very hard for several months accomplishing feats of strength, but loses weight steadily, which she can ill afford to do, and finally breaks down entirely, becoming a nervous wreck. The doctor, still believing exercise the proper thing for her, brings her to the Institute and personally gives directions as to her treatment. After talking the case over, he consents to leave the dosage to us (quite the reverse of his idea of exercise) for one month, still maintaining he has no faith in the treatment, but thinks it can at least do no harm. As a result, one month later the patient has gained six pounds and is making in every way satisfactory progress. Her father calls again to confess that he knew nothing about the application of exercise to the sick, although he had been a successful athlete himself and took his own medicine regularly. Similar incidents constantly occur, showing a lack of definite knowledge on the part of the general practitioner of this valuable agent.

In taking up the labor of editing this department of the JOURNAL it will be the Editor's pleasure to review whatever comes to his notice within the field and also to advise physicians as to the application of this most abused, as well as most delicate, therapeutic agent. If by so doing he can aid some portion of the medical profession to a better understanding of the use and limitations of exercise in health and disease, he will be fully repaid.

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*Corrective Exercises for a Case of Lateral Curvature of the Spine.* By Prescott Le Breton, M. D., of Buffalo, N. Y., in American Medicine for February 1, 1902.

For the last twenty years the treatment of lateral curvature of the spine has been considered, and now plaster-of-paris, steel supports, and recumbency have been replaced by gymnastics and forcible correction. Each case requires special individual attention.

In selecting a series of exercises for a patient the keynote position is first obtained. With heels together, toes pointed slightly outward, shoulders and head drawn backward and figure erect, she places her hands on her hips and stretches her trunk upward, straightening the spine as far as possible and keeping the shoulders on a level. The surgeon must now con-

inue the correction, while the patient maintains this strained position with her hands dropped to the sides. Placing one hand on the ribs on the convex side and the other hand on the opposite shoulder the trunk is swayed in its relation to the pelvis until the whole figure assumes a better position. In dorsal curvature to the right the sway is to the left and vice versa. Also the bulging ribs are compressed by the palm, thus rotating the bodies of the vertebræ as far as possible. The attempt of the patient to maintain this last change brings into play the deeper spinal muscles, and its repetition teaches the patient to voluntarily assume the corrected position. The projection of the hip on the concave side of a lumbar curvature may be modified by advancement of the pelvis on this side, causing rotation of the lumbar vertebræ; the motion involved taking place in the lower spinal region while the upper spinal position remains unchanged. Having once mastered this, exercises are commenced and the instructor finds that again and again the exercise must be discontinued and the keynote position regained, for the patient, removing her attention from the spinal posture, loses part of the correction. In every exercise the patient must have her mind concentrated on this position until she can unconsciously hold it during her gymnastics and continue an improved position during the rest of the day. The objects of the exercise are to strengthen the weakened muscles, stretch the contracted ligaments and tissues, straighten the spine still more, and to teach the pupil to gain and hold a correct attitude while she walks, stands, and sits.

To select proper exercises for any individual case the instructor must know the pathology of lateral curvature and make use of that knowledge. He must watch the effect of each movement, viewing alternately the back and chest of his patient, and see that the deformity is not increased in one part while diminished in another. An excellent rule for determining whether or not an exercise is suitable is to have the patient do the opposite—*i. e.*, if she has raised a weight in the left hand and the deformity lessens, let the weight be raised by the right hand and see a proportionate increase of deformity. As improvement is obtained repeated changes are in order, more bilateral work is given, and general exercises for all the different groups of muscles of the body are of great service. Finally the patient may be dismissed when improvement is at its maximum, with orders to continue gymnastics and to report for inspection occasionally during adolescence.

Exercises Given to Special Case.—1. The keynote position.  
2. Retaining the erect posture, the patient walks forward a dozen steps, then backward to starting-point and repeats.  
3. Taking a dumbbell or weight in left hand, the patient raises it above the head and repeats the movement until exhausted. (See Fig. 1.)

4. Raising the left arm outward from the body until horizontal the patient swings it around in front of the body to the right. This vigorous movement straightens the spine and forces out the sunken ribs on the left side, as seen in Fig. 2.

5. The patient with arms extended above the head and hands clasped, bends laterally to the right, trying to overcome



Fig. 1.



Fig. 2.

Fig. 3.

the dorsal curve and to refrain from bending in the lumbar region. (See Fig. 3.)

6. Respiratory exercises. Forced inspirations and expirations.

7. The right arm is raised in front of the body to a horizontal plane and is swung repeatedly backward in the horizontal plane as far as possible.

8. Extending both arms above head, and clasping hands, the patient rises on toes and descends about thirty times.

9. Maintaining the spine in its best position and arms parallel to the trunk, the patient bends forward and downward and returns, all of the movement occurring at the pelvis and lower lumbar region. At first the pelvis is steadied by the instructor. This exercises equally the spinal muscles.

10. The patient standing with right side toward the wall, and about three feet from it, places palm of right hand against the wall, raises the extended left arm out, up and over head till finger-tips touch right forearm. Forceful movement is required, and the elbow is flexed at the latter part of the exercise. An attempt is made to bend the spine laterally in the dorsal region, puckering in the projecting ribs and lessening the dorsal curve. This swing of the arm pulls the spinous processes in the dorsal region to the left through traction on the trapezius

and rhomboid muscles, and lessens the rotation of the bodies of the vertebrae.

11. An exercise similar to the last, in which the palm of the right hand of the patient is placed on the bulging ribs instead of against the wall. The left arm is thrown over the head to the right, the patient attempts to bend in the spine in the dorsal region, and the right hand assists by direct pressure.

12. Placing hands on hips the patient kicks out sharply with the right leg sideways from the body. Coincidentally the spinal muscles are called into play, and the spine straightens. In patients with marked secondary curve in the lumbar region, better effects are seen with movement outward of the left leg.

13. Standing on toes with heels together and hands on hips the patient bends her knees, squatting down, then rising, with about ten repetitions of the movement.

14. Lying on the floor, face downward and hands clasped behind the head, the patient raises head and shoulders, hyper-extending the spine. The breath is not held during this difficult exercise. The instructor has two duties—to steady the pelvis and prevent exaggeration of the dorsal curve.

15. Again lying on the floor, with face downward and arms by the sides, the patient swings left arm up over head to the right, as in exercise No. 10, while the instructor steadies the pelvis and forcibly compresses the ribs on the convex side of the curve.

The patient, whose exercises have been enumerated, has also been treated by forcible correction in the modified Hoffa machine, and has worn for a few hours each day a corrective jacket, which continues the corrective force applied by the machine. This case is an example of the ordinary type of lateral curvature as seen in the adolescent, and the treatment as outlined here is meant for similar cases, and not for patients whose curvatures are due to empyema, paralysis, congenital deformity, etc.

In closing, we may quote the following sentences from two authors: "It is by means of frequent and forcible temporary reductions of deformities, by voluntary muscular action, that we can hope to improve and do improve those cases which are amenable to any form of active treatment" (Teschner).

"It may be stated that any treatment that makes the spine more flexible, that overcomes faulty attitudes and that strengthens the muscles, must be of benefit to the patient, the degree of benefit corresponding to the persistence and energy of the pupil and the instructor rather than to any particular theory on which such treatment is based" (Whitman).

The value of physical exercise in connection with orthopaedic cases is too frequently underestimated. While indorsing the above, I feel that more stress should be put upon the importance of general development to support the correction

and nutrition of the body by regulation of habit, diet, and other general systemic treatment. The forced rotation and correction of the spine, in suspension both by the arms and legs, should be added to the treatment. I have been able to get better keynote positions by carrying the exercises on to heavy gymnastics where the body becomes the weight and the muscles operate, while the spine is straightened by weight, while the vertebræ separate and the ligaments are stretched, than by superimposed weight under very careful direction.

#### NOTES AND COMMENTS.

We would congratulate the editors of the *Journal of Physical Therapeutics* upon the interesting character of the April number, and upon having become the official organ of the British Electro-therapeutic Society.

From the preparations which are being made, and the enthusiasm manifested, the Twelfth Annual Meeting of the American Electro-Therapeutic Association, to be held at the Hotel Kaaterskill during the first week in September, will be a decided success.

We note that Charles P. Renner, M. D., has taken editorial charge of the *American X-ray Journal*. We wish the doctor success in his new field.

#### NEW AND IMPROVED APPARATUS.

*A New Faradimeter.* By Samuel Sloan, M. D., Glasgow.

Having discovered early in my electro-therapeutic practice that no reliance could be placed on the results of treatment by means of the faradic or induced current, it occurred to me that this might be due to the impossibility of measuring the amount given, or even of knowing for certain that there was any current at all in operation. There being no instrument in the market capable of supplying this want, I set myself, some years ago, to design one. The objects aimed at in the instrument were the following:

1. That it be able to show the presence and to measure the amount of the current when this was less than a sensitive part of the body, such as the brow, could detect the presence of.
2. That it be reliable; the same current always causing the same deflection of the needle, without tapping to coax the needle one way or the other.
3. That the needle always and absolutely return to the zero point.
4. That variations of temperature or draughts of air have no influence in displacing the needle from the zero point.
5. That parallax be provided against; especially in very small deflections.

6. That the instrument be dead beat.
7. That it be independent of iron cores and of permanent magnets.
8. That the instrument be portable.
9. That the resistance be moderate, to allow of a fair amount of current being possible, when the intensity is low.



• Dr. Samuel Sloan's Fara limeter, with cover removed. Half natural size.

10. That the shunts be true for alternating, and not simply for continuous currents.

Some of these objects have been more difficult to attain than others; but all the difficulties have now been overcome.

The Faradimeter is on the principle of the electro-dynamometer, but gives direct readings. It indicates instantly any variation in the current. It is composed of two fixed coils, with a rotating coil between them, to which is attached the pointer. All the coils are as close as possible to each other. When the instrument has been leveled, the suspended coil is turned, so as to bring the needle to the zero point by means of the revolving stage, from which it is suspended by about one inch of finest bronze ribbon. If the needle is not absolutely at zero, a slight turn of one of the leveling screws will suffice to do this without pulling the instrument off the level. Once set

there is no need to repeat this, even when it is moved from place to place; unless some accident happen to it. In this case, the revolving stage is fitted with the means of easily replacing the bronze ribbon, and of lowering or raising the suspended coil, so as to put it exactly into position. The current is carried off the suspended coil by means of a long spiral of finest bronze ribbon; the halves of this being in reverse directions to prevent displacement of the needle from zero, under the influence of changes of temperature on the spiral. The instrument is made dead beat by means of vanes of mica attached to a pointer fixed to the under part of the coil; and, to prevent the action of internal currents of air through slight changes of temperature in the surrounding atmosphere, these vanes are inclosed in a small cell. The indicating needle is also inclosed in a cell; since, though it is extremely fine, some slight deviation from the zero point would otherwise result from its exposure to internal currents, as when placed near an open window. The rotating coil can be easily fixed, and kept in this position so as to make the Fardimeter portable; which its comparatively small size renders easy. By means of two shunts the scale can be made to read up to 15 milliamperes, the highest reading required for electro-therapeutic treatment; whilst as low an amount of current as 1-5th millampere can be read off on the scale. By one millampere faradic current I mean the electro-magnetic equivalent of an amount of sinusoidal alternating current, the galvanometric measurement of whose sinusoidal galvanic equivalent is one millampere. During calibration the earth's magnetism is controlled by a permanent magnet, placed at the necessary distance above the coils. One millampere sinusoidal galvanic current causes, I find, about twice the deflection brought about by one millampere from a battery. Parallax is avoided by means of two fine strips of metal rising vertically from the pointer and about one inch apart. The total resistance of the instrument is slightly over 800 ohms. The fixed bobbins have each 250 turns of No. 36 S. W. G. copper wire; whilst the moving coil has about 1000 turns of No. 47 wire. The wire for the shunts is wound inductively and horizontally, immediately below the bronze spiral; so that the currents passing through them may not affect the magnetic field around the revolving coil; and not only are the resistances proportional to the total resistance of the instrument, but the windings in the shunt coils are also proportionate in number to the total number of windings of the three coils.

I have found this Fardimeter of immense service, and deem such an instrument absolutely essential to the proper therapeutic use of the faradic and the alternating sinusoidal currents.

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## LUPUS VULGARIS AND ITS MORE MODERN TREATMENT.\*

BY ALBERT C. GEYSER, M. D.,

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Medical Association, Medical Society of the Borough of Bronx, and  
National Society of Electro-Therapeutics.

It is not within the scope of this paper to do more than make mention of the more salient points connected with this disease. The details of ætiology, pathology, and diagnosis are well understood as fully treated in appropriate text-books. When the disease is recognized to be lupus vulgaris it has in most cases been in existence for some time and has become chronic. It is therefore the chronic form that interests us most.

It is now universally conceded that the bacillus tuberculosis is the cause of the affection, although it may be difficult to prove its presence in all cases. It has been demonstrated, however, that if the search was continued with sufficient diligence, the bacillus has been found in more than ninety per cent. of cases.

In a large percentage of patients suffering from lupus vulgaris tubercular lesions in other structures of the same patient are apt to be present, and when such is not the case, a tubercular family history is the rule. There are a few cases where the bacillus finds entrance to the skin through some abrasion or external wound, or it may effect its invasion through the blood and lymph channels from within to some point where, on account of trauma or other agency, local resistance has been enfeebled.

\* Read before the Clinical Society of the New York School of Physical Therapeutics on Friday evening, May 16, 1902.

The disease manifests itself in the manner characteristic of tuberculosis—appearing as one or more small, rather hard nodules, simulating acne, with little or no pain. Instead of healing and disappearing, under ordinary treatment it persists and breaks down and spreads at its periphery, with the formation of thick crusts, while the center has a tendency to assume cicatricial-like tissue, which on the slightest occasion breaks



Fig. 1.

Fig. 2.

down again. This process goes on rapidly or slowly until we have finally an unmistakable picture, seldom forgotten when once seen in a typical case.

The usual progress is slow; some cases apparently remain stationary for years and then seem to start with a new impetus, which continues for a shorter or longer time, when again it comes to a dormant state. One point, however, is noteworthy—the more energetic and persistent the treatment has been, if a failure resulted the effort seems to have added fuel to the fire, for it then spreads more rapidly and is harder to control even by the more recent methods.

From a pathological standpoint, then, lupus vulgaris is a local tuberculosis of the skin; the essential lesion is a new growth, resulting from the irritation caused by the presence of the bacillus tuberculosis. Microscopic sections of this tissue present nearly all the peculiarities of tubercular tissue found in other structures. The treatment in the past

has not been very satisfactory, to judge from the history of the patients or the duration of their disease. The text-books treating of the management of lupus vulgaris, after enumerating a variety of treatments (and that in itself is always ominous), frequently close the chapter by saying that in a certain percentage of cases, in spite of all we may do to overcome this disease, the patient is doomed to suffer indefinitely.



Fig. 3.

Fig. 4.

Internal medication has shown no specific influence over this affection and can therefore be discarded; neither will we consider any of the numerous methods in use previous to the advent of the X-ray.

We are now thoroughly familiar with the work done by the X-ray. If there is any one therapeutic measure entitled to the term specific, we should bestow it upon the current emanating from a static machine. It was my privilege to present a résumé of a number of cases at the meeting of the National Electro-therapeutic Society held in Atlantic City in 1900. In that paper were reported the actual cures of cases of lupus vulgaris and lupus erythematosus, not alone by the X-ray, but by the brush discharge. Two and one half years have elapsed

and those cases remain cured. My earlier cases were treated and cured by the X-ray alone. A later method has been to treat cases with the X-ray until the reaction necessitated their stoppage, when the brush discharge from metallic and wooden electrodes was substituted. Cases treated in this manner have recovered more promptly than when the X-ray alone was used. We vary the methods to suit the indications of individual cases. When it is desirable to set up a strong counter-



Fig. 5.

Fig. 6.

irritating effect the X-ray is used until a condition bordering on an idiopathic dermatitis is induced. When the tissues recover from this effect, the lupus disappears with it. Others are treated with the brush discharge from a wooden electrode of soft maple, because experience has demonstrated that the discharge when a wooden electrode is employed is more beneficial than the metallic spray.

Still other cases do better when the combined method is employed, especially when there are certain areas, as the margins of the lesions in some intractable cases. In these the X-ray sets up a new activity in the form of X-ray dermatitis and seems to aid materially the healing process of the brush discharge.

**Method of Treatment.**—When using the X-ray it is necessary to protect the healthy tissues in such a manner that they will not be affected. This was accomplished by the interpo-

sition of sheet lead or sheet tin in my earlier treatments, but the metal had an unpleasant habit of becoming charged with a current by induction, which was unpleasant to the patient. The metal also attracted some of the current from the terminals of the tube, thereby lessening the energy to be expended within. After experimenting with various substances, I adopted sheet rubber for the purpose, and find it to be the



Fig. 7.

Fig. 8.

best available material. These sheets of rubber can be procured at almost any hardware store. They are inexpensive, clean, and indestructible, and may be made of any desired size or shape. As shields they effectually absorb the rays and prevent dermatitis.

We commend then the specific action of the X-ray with the substitution of the brush discharge from a wooden ball electrode at the proper time, thereby avoiding undesirable results from prolonged use of X-rays.

The use of rubber protection for the various reasons before mentioned is also recommended.

The following cases, with the cuts taken before and after treatment, show the results of the method.

**CASE I** (see Figs. 1 and 2).—*Lupus vulgaris* began at the age of thirteen years, as a small pimple upon the cheek, gradually spreading until it was of seven years' standing. Treatment consisted of three exposures to the X-ray, using a tube that would back up a 4-inch spark-gap from a Van Houten and Ten Broeck 10-plate static machine. The distance from the tube was about six inches. The healthy tissues were shielded with sheet rubber. A slight dermatitis resulted. She was then treated three times weekly for one month, re-



Fig. 9.

Fig. 10.

ceiving twelve brush discharge treatments, or in all fifteen treatments and has remained well for more than one year.

**CASE II** (see Figs 3 and 4).—Age sixteen, tubercular family history. The first nodule appeared at nine years of age and gradually grew worse in spite of continuous treatment. January 16, 1900, received the first X-ray exposure of ten minutes at a distance from the tube of four inches with rubber sheet protection. After fourth exposure a slight dermatitis developed and the brush discharge from a soft maple wooden electrode was substituted. Three treatments per week were administered until the patient was discharged in May, 1900, and has since remained cured.

**CASE III** (see Figs. 5 and 6).—Age nineteen; tubercular family history. Both parents died of tuberculosis during the

patient's infancy. Disease began as a single pimple upon the nose, in a short time this increased to three nodules. They gradually spread to the lips, cheeks, and inside of the nose and mouth, as well as affecting one eye; she was obliged to leave school at thirteen years of age on account of her grawsome appearance, was treated by all known methods, each of which seemed to add fuel to the fire, and was finally obliged to take her nourishment through a glass tube, which she did for two years. She could not open the mouth nor part the lips. She received in all thirty-four X-ray exposures, which were followed by thirty applications of the brush discharge. A complete cure resulted as far as the face was concerned.

The patient, however, has since developed tubercular bone lesions upon several parts of her body, as the skiagraphs show (see Fig. 7 and 8); the most remarkable thing being the fact that, although having a tubercular family history, and the patient herself tubercular, yet regardless of this fact her face healed and has remained so, while other tubercular lesions have developed and grown worse.

CASE IV (see Figs. 9 and 10).—Twenty-eight years of age; one brother died of tuberculosis. At the age of eighteen years a few small nodules appeared upon his upper lip, gradually spreading to cheek and neck; his appearance soon caused him to lose his position as a salesman. X-ray exposures were begun in February, 1900. Fourteen exposures were made, when a marked dermatitis resulted. He then received twenty treatments with the brush discharge, when he was discharged as cured, and has remained so. The second photograph was taken one month before being discharged.



## ELECTRICAL TREATMENT OF STOMACH DILATATION.

BY FREDERICK H. MORSE, M. D., MELROSE, MASS.,

President of the American Electro-Therapeutic Association.

Dilatation of the stomach may arise from a variety of causes; it may be uniformly dilated, or it may be distended in eroded or ulcerated pouches in its walls.

The condition often results from stenosis at the pyloric orifice, from cancer or ulceration, and adhesions from corrosive poisons, or any obstruction at the pylorus, as with cancer of the liver, gall, bladder, or pancreas, causing pressure externally upon the stomach; also with impaired peristaltic action from paralysis and parenchymatous degeneration in severe constitutional diseases, as in typhoid fever, diphtheria, etc.

The particular condition with which I have to deal in this paper is that form which accompanies and follows acute and chronic gastric catarrh, resulting usually from eating or drinking immoderately, or both, and especially from food which will ferment, and by accumulated gases, continue to stretch the already overloaded stomach.

The condition known as gastrophtosis, as one of the consequences, is often associated with nephroptosis (looseness of the attachment, and prolapsus of the kidney), with more or less partial or general prolapse of the bowel (enteroptosis). In fact, all of the abdominal organs may suffer, directly or indirectly, from a dilated stomach.

The loss of muscular tone present in the supports of the abdominal viscera is many times due to the insufficiency of the abdominal wall, as is characterized by the build of the patient. Undersized, thin subjects oftentimes take on this condition rapidly, when a more robust person with an equally bad stomach would be much longer in arriving at the stage of general visceral prolapse (splanchnoptosis).

Whatever the cause, the indications for treatment are, to restore the muscular and nerve tone, as far as possible, and remove everything that can in any possible way cause fer-

mentation or putrefaction of the stomach contents and necessarily prolong the condition.

Cases occurring from the first-mentioned cause are incurable; and indeed very little can be done to induce even a partial restoration of function. But so much can be done with stomachs that have for months and years resisted purely medicinal treatment for the so-called "chronic dyspepsia," by the proper use of electricity, that I feel justified in referring to a condition that frequently comes under my observation. In addition to strict attention to diet, the usual necessary treatment of the catarrhal condition by lavage, hcl., silver nitrate, and anti-fermentatives, such as salicylate of soda, the matter of greater importance is to improve the general nutrition as well as of the stomach, and increase the tonicity of the surrounding visceral supports.

The technique of the treatment consists, first, of the application of galvanism, percutaneous method, using for the stomach electrode a large oblong piece of punk, because of its possibility of close adaptation to the surface, the other one being placed on the back and above the region of the stomach, to cover its nerve supply.

A current of about 15 ma. is used, followed by the static induced, of sufficient strength to produce a visible muscular contraction. The position of the electrodes may be varied, according as we have to deal with simple dilatation or dilatation accompanied by gastrophtosis, nephrophtosis, or enterophtosis; the principle stands good for all. Relief of the dragging sensation and pain, especially in the right epigastric region, is one of the marked signs of improvement which shows itself early in the treatment.

We cite the following cases:

CASE I.—Mrs. R., age forty-four, consulted me September 23, 1900. She had the usual symptoms of chronic gastric catarrh—stomach dilated to the capacity of four and one-half pints as was shown by the amount of fluid used when washing out the stomach. She was much emaciated and anaemic, and had the history of a similar condition for several months previous. Her treatment consisted of applications twice a week, galvanic and static induced currents for two months, and once a week for six weeks, at which time she was discharged, having gained nine pounds in weight. Her general

condition and digestion were so improved that she expressed herself as "feeling perfectly well." There has been no return of the symptoms.

CASE II.—Miss P., age forty, had been an invalid for seven years, her only disorder being chronic gastritis. She had a very markedly dilated stomach, the dragging sensation and pain being very pronounced at the pylorus for a considerable time after taking food. The treatment was almost wholly electrical, special attention was given to the application to the case of the static induced current, although intra-gastric faradization was also used. At the end of six months all the symptoms referable to gastropotosis and enteroptosis had disappeared, and she was able to eat nearly all ordinary foods without any disturbance, and had gained considerable weight.

I might mention several cases that have recently come under my notice, but time will not permit; suffice to say that in my opinion the use of mild currents of galvanism, with large, well-adapted electrodes (I prefer punk and asbestos paper for the purpose), and the static induced current, using the same electrodes, with as powerful interruptions as the patient will tolerate without causing pain or any other unpleasant disturbance. The improvement in the general nutrition, in addition to the special tonic effect to the parts between the electrodes, is usually quite marked early in the treatment.

In cases that are far advanced, whether or not accompanied by floating kidney, while a cure is not to be expected, the relief obtained is very gratifying, and it seems to be the only method that would be productive of favorable results.

The intra-gastric method, while it is theoretically very good, is hardly practicable in the majority of cases.



## ETHER.

BY GEORGE ADAM, M. D.

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and Surgeons, San Francisco, Cal.

*The Molecular Concept of the Physiologic Unit.*—It is conceivable that two or more molecules can be compressed into one, the sum of the inductive potentials of the primary molecules being represented in a common induced magnetic field. Under certain degrees of pressure and ether-energy, molecules may be built up to an indefinite maximum number of chemic atoms, each atom being a group of units which, as a group, has no distinct entity in the molecular construction, the immolecular units being in absolute contact, and being more or less mutually neutralized. Thus, physiologists have estimated that some molecules contain two thousand chemic atoms. It is clear that the limit to the size of the molecule is indefinite, depending on the equilibrium of matter, and it is possible that under physiologic conditions a molecule may exist which can be seen and examined by means of the microscope, or even handled as an ordinary mass.

Bearing in mind that a molecule is the physical unit; that it is composed of an indefinite number of ether-units which vary in relative proportions of positivities and negativities, differing in relative placement; that its potential is represented by induction in an environing magnetic field; that it has the property of assuming differential poles; and that within its construction there are no units nor groups of units—atoms—which can be characterized as a molecule or sub-molecule, then the concept that the physiologic unit is a molecule can be formulated. That the nucleoli of animal cells, the anisotropic substance of muscles, the analogous unit in conducting nerve tissue, etc., are molecules of inductive negative potential, with all the properties of the physical unit, is readily conceivable when the above definition of a molecule is accepted.

If it can be shown that the physiologic unit is surrounded by an induced magnetic field, the molecular condition of the unit is proven. A mass composed of molecules has no induced field, as the inductive potential of each molecule is fully represented in its own induced field. It follows that a mass is

a body composed of molecules, but it is possible that there are molecules which are larger than some masses.

In the induced field of small molecules ether is the polarized element, as no other is so molecularly minute as to be capable of filling the intermolecular spaces. In the induced field of large molecules, and in those of electrically charged masses, ponderable molecules are polarized. Consequently there is found in the induced magnetic field of the anisotropic substance of the muscle and in the induced magnetic fields—the nuclei—of all nucleoli, molecules of ponderable matter, which are polarized by the inductive potential of the primary force resident in these bodies.

The potential of nucleoli and of all physiologic units is of negative quality. The fact of the stimulated or leading off point of a muscle becoming negative is only explainable on this hypothesis; and with this hypothesis the mass of electro-neural facts is consistent.

The molecular conception of the physiologic unit renders possible the explanation of muscular, neural, gland-cell, and electric-cell action. The details of the phenomena of fecundation, cell-division, cell-movements, and osmosis fully accord with the fundamental properties of the molecule and physiologic unit as defined.

Commencing with the same histological unit or molecule—the neuro-musculo-electro-grandular cell or disk—fundamentally constructed on the same plan, a molecule of high potential, nature stretches the units in line and makes use of their property of conductivity; she places others in tiers, compresses or distorts them by an elastic sheath, and for her purposes calls forth the common property of all matter, under certain conditions, of assuming the spherical form, and she has contractility; she arranges them in pile form, places them within a circuit, and behold she has an electric current; or by modification of arrangement, from the ions produced as the result of molecular polarization, she constructs a molecule of extreme potential—an anabolism. In all of this, nature uses a molecule of high potential, polarizable by the stimulus of a central nervous organization.

When the molecule or cell is polarized, whether there is manifested the property of conduction by vibrations; whether a physical movement of the body is accomplished; whether the

shock from an electric organ is felt; or whether a cell of the blood emerges from a gland loaded with potential, depends on the placement, connections, and surrounding conditions, and not upon an alteration of principle in the polarizable molecule or cell of high potential.

Relationship of the Anisotropic to the Isotropic Substance.—Polarization is evidently the important fundamental principle of contractility. The polarization of the ether molecule is rendered possible by ether having no frictional properties, consequently an ether molecule has perfect freedom in the modification of its form. The polarization of an ordinary molecule of ponderable matter is made possible by its being surrounded by intermolecular ether, thus giving the molecule a free vibratory field. The environing conditions of the anisotropic substances are equally plain. The anisotropic substance is imbedded in the more fluid isotropic substance, giving the former perfect freedom as regards polarization and modification of its distorted form—distorted by the elastic sheath. The isotropic substance fills up the free vibratory space of the polarizing anisotropic substance, and occupies a position analogous to intermolecular ether in the latter's relationship to a vibratory ponderable molecule. But the isotropic substance possesses other functions. It supplies the anisotropic substance with associated molecules of polarization, an essentiality to the accomplishment of polarization or contractility, just as the water of crystallization is to the crystallization of certain salts. They are associated on polarization, and dissociated on depolarization, their molecular condition being left intact.

What are the molecules of association which are necessary to the polarization of the anisotropic substance, and therefore to contractility? It is possible that they are simply carbon dioxid; although probably they consist of calcium carbonate, or some other soluble salt of calcium, and may be different for voluntary and involuntary muscles. For the cardiac muscle sodium chlorid may be the associating molecule of polarization. Under a slight stimulus the anisotropic molecule polarizes, the associated molecule of polarization is drawn within the anisotropic sphere, the hemispheres become symmetrical, the molecule rounds out into a true globular form, it is under a condition of strain, the elasticity of the sheath is overcome, the muscles becomes round, hard, and tense—contracts.

The transformation of force is as follows: histological molecules or cells are polarized by an initiatory exciting force, and by their inherent potential, the latter being the greater and more important. This is force spent, and results in the decomposition of molecules, absorbed as nutrition, into ions. The polarized physiologic units consequently must have lost in potential—that is, in the number of atoms in their construction. Independently, therefore, of the molecules of polarization, ions must be given off from the constituencies of the polarized cells or molecules at the moment of depolarization. These probably form carbon dioxid and water, or carbon dioxid alone.

Accordingly the function of the isotropic substance is important. It furnishes the associated molecules of polarization to the anisotropic substance, and also furnishes molecules to build up the anisotropic substance after the latter has lost potential by polarization. The latter is a nutritive process, and is accomplished by the law of equipotential surfaces. The nutritive elements are associated as molecules and dissociated as ions. Consequently, the function of the isotropic substance is threefold: It forms the vibratory space of the anisotropic substance; holds in solution associated molecules of polarization; and is a storehouse of nutrition.

Generally, the principle of the transformation of force connected with functional activity of nerve, muscle, gland, and other histologic cells, or molecules, is the splitting up of molecules into ions; these ions combining in simple forms of molecules set free energy,—ether from the polarized induced fields of higher chemic potentials,—the freed energy radiating as heat or circulating as electricity; or, under favorable conditions of pressure and temperature, the ions with the energy may be stored in other molecules or cells. The latter takes place in glands, especially in the thyroid. The function of this gland being to build up molecules—globulins of the blood—in potential, these, like ships, unload at distant ports. Specially, the physiologic unit or molecule takes on CO, or H, CO, as molecular nutriment, and at the moment of depolarization these are freed as ions: at the positive pole carbon and hydrogen, and at the negative pole oxygen, the differentiated results depending on the environment of the physiological unit.

(To be continued.)

## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN,  
CONN.

**Physician in charge Newhope Hot Air Sanitarium, New Haven, Conn., Professor of Thermo-therapy in the New York School of Physical Therapeutics, Member of the American Medical Association, American Association for the Advancement of Science, American Electro-Therapeutic Association, Charter Member Roentgen Society of the United States, Member Yale Medical Alumni Association, etc.**

## CHAPTER X.

ARTHRITIS DEFORMANS—(*concluded*).

That form of the disease which affects the smaller joints is common enough and familiar enough not to require illustration, but the following case exemplifies very well the variety which involves the larger joints as regards clinical characteristics and response to treatment.

Mrs. E. L. P., aged sixty-two years. Patient had noticed a soreness coming on after walking, just below the crest of the right ilium, four months previous to her consultation with me, which soreness had grown rapidly worse for two months, by which time it had extended so that it involved the front and inner aspect of the thigh as far down as the knee. It had continued to increase, until the pain was present in the hip, groin, front and inner aspect of the thigh, and streaked down below the knee into the heel along the posterior aspect of the leg, and her condition as regards pain and ability to move about was pitiable in the extreme. Was sleeping very poorly because of pain and muscular spasm in thigh, which awakened her frequently during the night. Suffered frequently from hot flashes and formications irregularly distributed over the body. Appetite fair and bowels regular. She was markedly neurasthenic, and had been so since passing the climacteric, twenty years previously. At this time she had also suffered quite severely from asthma, but this had disappeared after a stay in another city, and had never returned. There was no history of injury. Mouth temperature had ranged from 97° F., in the morning, to 99.6° F., at night. The extensor muscles of the thigh on the affected side had been somewhat stiff and sore upon pressure

for the preceding ten months, but she had not paid much attention to the matter until the acute and constant pain had drawn her attention to its development. Had been treated for rheumatism up to this time, but without beneficial result.

Her mother had died of consumption, and her maternal grandfather was supposed to have died of it. She was one of a family of eleven brothers and sisters, seven of whom were dead, and their health histories and causes of death were negative as far as indicating hereditary taint was concerned. Father had died of dysentery at the age of seventy-three years.

Physical examination showed that the arcus senilis was well developed, and arteries were atheromatous, but heart sounds did not exhibit any abnormality, and lungs were sound. There were no evidences of past or present disease in the small joints, and no tenderness was present. She was unable to cross the right leg over the left knee without lifting it with her hand, a very characteristic phenomenon when this disease attacks the hip joint. Patellar reflexes slightly increased, and more so on the affected side.

The characteristic pigmentation of the skin was present on the upper and outer aspects of the affected thigh and on the abdomen. Sensory phenomena in the skin covering the affected thigh and leg were normal. Passively moving the hip joint caused only a feeling of soreness, but smartly tapping the bottom of the right heel with the leg extended caused the patient to cry out, and firmly pressing the head of the femur inward against the acetabulum, or tapping it sharply, produced the same result. The sciatic nerve was sensitive to pressure back of the trochanter, but nowhere else, and deep pressure in the groin just outside of Poupart's ligament elicited pain. Her urine contained a trace of albumin, but no casts.

It will be noticed that the characteristic signs of arthritis deformans of the hip joint were present, viz., inability to cross the affected limb over the opposite one unaided; pain in the hip reflected into the groin; pain upon pressing the head of the femur sharply and firmly against the acetabulum; the characteristic pigment spots in the skin; and the typical slight elevation of temperature with a regular course. The diagnosis lay between pelvic neoplasm, involving the sacral plexus or its branches, which was ruled out by physical examination; sciatic neuritis, which was excluded by the absence of sensory dis-

turbances in the distribution of the nerve, and the fact that stretching it by flexing the thigh upon the body did not produce pain, until the hip joint began to be strained; and tuberculosis of the joint. The yellow spots, temperature curve, and intensity of the pain decided in favor of arthritis deformans, and I made this diagnosis.

She was admitted to the sanitarium for treatment May 15, 1900, four months after the acute trouble started. She was treated with the current from the high-tension coil through the joint that evening, with resulting marked remission of the pain, but she did not sleep well because of nervous irritability and muscular spasms in the affected thigh, which awakened her several times. The next day she was given a body hot-air treatment, which did away with the pain entirely while she was in the apparatus, but it returned sharply an hour afterward. This was repeated every day the first week, and every other day the second week. Local hot-air treatments failed to relieve the pain effectually, so they were abandoned and the current from the high-tension faradic coil, which performed this office better than anything else, was substituted at least once, and sometimes twice, daily. During the night of May 18 she slept uninterruptedly all night, something she had not done before in many weeks, and she continued to sleep very well thereafter. The next day it was noticed that her limp was diminishing. On May 21 it was observed that the arteries at the wrist were growing softer and more elastic, and, to dispose of this matter for good, I will say here that when she was discharged at the end of three months I was unable to observe that any atheroma was left. Finally, in this connection I will state that a large number of cases of atheroma, at least in vessels susceptible of palpation, respond to body hot air in this manner. It is not usual for it to disappear so entirely, however.

At the end of two weeks she was so far improved that she would be free from pain for twenty-four hours at a stretch, and could walk a short distance without bringing on her limp. If she continued walking, however, it would provoke the old soreness.

I decided to transfer her to the list of out-patients, and she returned to the sanitarium for treatment three times weekly for the next two weeks, and twice weekly thereafter until August 3, when I discharged her cured. At this time she had

suffered no pain of any description for two weeks. Her progress on the whole had been fairly steady, but there would be periods of two or three days at a time when her pains and debility would return upon her, as is usually the case with these patients. They rarely continue improving steadily from day to day, but have short periods of improvement followed by periods of retrogression, but each period of improvement reaches a little higher level than its predecessor, until the trouble finally fades gradually and entirely away.

I next heard from this patient on February 18, 1901, when she called upon me one afternoon and said that she had felt no trace of the previous trouble, until about six weeks before, when she had suffered from a severe attack of la grippe. This had been followed by the old familiar pain, which was increasing in intensity, but not in the same place. It now involved the left hip and right elbow, and pigmentation of the skin was present in these regions and about the clavicles.

As the initiation of the process was so recent, and she was able to be about, I put her upon the out-patient list, and she came to the sanitarium for a body treatment, followed by some static modality, three times weekly for the next two months. The treatments were then reduced in frequency to once a week for two months more, when she was discharged cured. The drugs given were the chloride of gold and sodium, arsenic, strychnine, and occasionally a short course of bismuth subnitrate and peptenzyme for slight attacks of indigestion. I met her six months afterwards, and she told me that she had not only had no pain or other evidence of her old trouble since her last visit to the sanitarium, but that she had never felt better in her life than she had since then.

This case is instructive in several ways. First, it is an example of pure, uncomplicated, and unadulterated arthritis deformans, and exhibits a beautifully typical symptom complex of the affection when it occurs in the hip joint; second, it shows the futility of anti-rheumatic treatment in pure cases of the disease; third, it illustrates during the first attack the power of body hot air alone in controlling it, as the faradism used acted only, and was intended only, as a sedative; fourth, it exemplifies the power of body hot-air treatment in lessening, and sometimes apparently removing entirely, atheroma of the arterial system; fifth, it is an example of the influence of acute disease

precipitating a relapse; and sixth, it exhibits the influence of the current from the high-tension coil in temporarily alleviating the pains of the disease when other means are inefficient. Usually static is effective for this purpose, but, as has been previously stated, faradism gives better results in rare cases.

It is generally believed that bony ankylosis never occurs in arthritis deformans, but I have seen one case which leads me to think that it sometimes does. The patient came under my care for an attack of the disease in his shoulders, wrists, fingers, knees, and ankles. Twelve years before, when eighteen years old, he had been confined to his bed for several months by the same trouble in his hips and toes, from which he had recovered. At the time he came under my charge his toe joints presented the characteristic deformities much exaggerated, and the pathological lesions were verified later, when he had the little toe of each foot amputated at the metatarso-phalangeal articulation, because they interfered with the wearing of shoes. The point of greatest interest in this connection, however, lies in the fact that both of his hips had been completely ankylosed by the first attack. It is conceivable that the ankylosis might have been due to exaggerated osteophytic outgrowths rather than true bony ankylosis, but it is hardly probable that such a phenomenon would have appeared in both hips during the same attack of the disease, and highly improbable that it would have reached the degree of complete ankylosis under these conditions. X-ray examination, as far as it went, also indicated bony ankylosis. This joint in adults, however, is not often as susceptible of satisfactory and conclusive diagnostic demonstration through the medium of X-rays as some others in the body, and it is frequently very safe to interpret the findings with the traditional grain of salt. This is the only case of the sort that I have ever seen. In this patient the disease was completely extinguished from those joints which were acutely involved when he came to me, in eight months, but of course no change took place in the original seats of the process.

The advantages exclusively dependent upon the use of hot air in the treatment of this affection are as follows:

Its profound influence upon metabolism increases the oxidation of waste material, and hence excretion through the skin, lungs, and kidneys, thereby relieving the already depressed

nervous functions from the further depression which would be induced by their retention in the body.

Its power of temporarily mitigating pain and its sedative action upon the nervous system increases greatly the amount of sleep procurable, which still further invigorates the nerve centers.

Its reflex action upon the nervous system as a whole is in the line of a stimulant to physiological repair, and a return to normal function; hence its judicious, intelligent use is not followed by any evil reactionary effects.

Finally, by its use we are enabled to restore to usefulness and comfort a very large proportion of the victims of this disease, who without it would be irrevocably doomed to a painful life of hopeless and helpless crippledom.

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### PRACTICAL MODIFICATION OF COW'S MILK.\*

BY J. A. MITCHELL, M. D.

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of Physical Therapeutics.

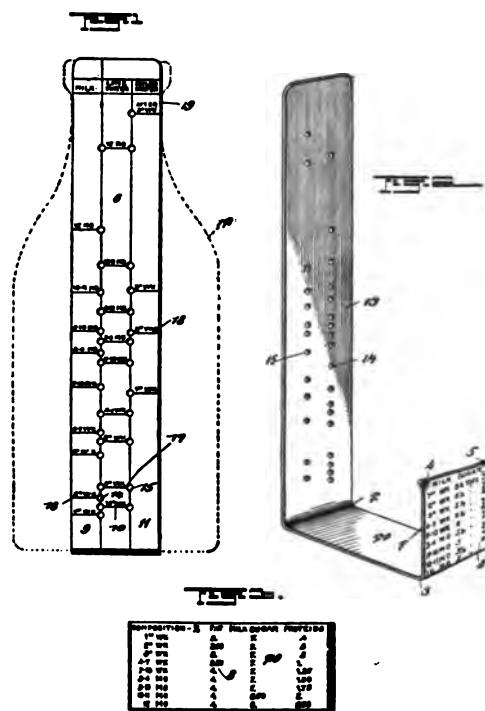
A great many physicians advise the use of condensed milk when feeding infants artificially, not that they prefer it to fresh cow's milk, but they give as their reason, that the directions for preparing the food, using condensed milk as a basis, are far more simple, it is easily prepared, the risk of contamination is not so great, and the expense is less than when using fresh milk.

The majority of infants seem to thrive on condensed milk, but they are more liable to rickets, and their vitality is not so good as those raised on fresh milk. To many adults milk, as usually prescribed, is deleterious, causing constipation, biliousness, diarrhea, etc., because the necessary precautions are not taken in prescribing.

Many patients placed on milk diet are told to drink as much milk as they can, having no regard whatever for the fact that the supply of nourishment for the body should equal the demand; very little or nothing is said about the source of supply,

\* Read before the meeting of the Clinical Society of the New York School of Physical Therapeutics, April 18, 1902.

prevention of contamination, etc. In typhoid fever the usual diet is milk, and though the digestive apparatus of most of these patients is as weak as that of a baby, they are usually given raw milk unmodified. Some modify milk for their adult patients by adding water, and where this is done, it is a fact



that these patients do not suffer from the effects of the milk as those who take it undiluted.

The object of this paper is to encourage the use of modified milk, for adults who require milk diet and for infants fed artificially, by making the modification of fresh milk practical. The milk should be mixed from a herd where all precautions are taken as to cleanliness, and have a good percentage of fat, bottled at the farm, immediately after milking and placed on the ice or in a cool place until ready to use. It should be bottled a sufficient length of time for the cream to rise before modifying. People living in the country and away from the

metropolitan centers may secure a few quart milk bottles in which to keep the milk.

Where an infant is to be fed artificially, one quart of milk per day is usually sufficient. For adults placed on milk diet, two quarts per day will usually suffice.

To modify one quart of milk, bottled in the regular quart milk jar or bottle, all that is necessary, with a few directions, is a gauge, a siphon, lime water, boiled water, sugar of milk or cane sugar, and a teaspoon.

The gauge which I have devised for measuring various quantities of milk, lime water, and boiled water, is in the shape of the letter L, and is so made as to be applied to a regular quart milk bottle. The long arm (6) of the gauge is of a length approximating the height of the bottle, and on the outer face is provided graduations, 9, 10, 11, indicating, respectively, the amounts of milk, lime water, and boiled water to be used. Adjacent to these graduations and between the same, are located two rows of peep holes, 14, 15, through which the observer may see the contents of the bottle and locate exactly the depth of the fluids therein contained. Upon the bottom face, 20, is a table showing the percentage composition of fat, milk, sugar, and proteid material of the milk as modified.

Upon the face of the short arm of the gauge is a table, 8, to indicate the number of teaspoonfuls of sugar to be used in modifying the milk.

The graduations on the long arm of the gauge have been labeled for a normal child at different ages, in order to make it easily understood.

Where the physician is directing the artificial feeding of an infant, the table of percentage composition will be the guide and the same may be said of adults placed on milk diet.

The siphon is made of a small glass tube twelve inches long which has attached to it a piece of rubber tubing eighteen inches long.

Directions for modifying.—Place the bottle of milk, which has stood undisturbed a sufficient length of time for the cream to rise, on the foot piece of the gauge, so that the gauge is held firmly to the bottle by the short arm, 8, as above described. Remove, by means of the siphon, milk from the bottom of the bottle, until the upper level of the cream reaches

the desired level as indicated on the milk column, 9, of the long arm of the gauge. Remove the siphon and add lime water until the upper level of the mixture reaches the desired level as indicated on the lime-water column, 10, of the long arm of the gauge. Add sugar of milk, the amount in tea-spoonfuls, as indicated on the short arm, 8, of the gauge. Add boiled water (cold) until the upper level of the mixture reaches the desired level, as indicated on the boiled water column, 11, of the long arm of the gauge.

*Example.*—Child, two weeks old. Remove milk from the bottom of the bottle until the upper level of the cream reaches the horizontal line, 16, on the milk column of the gauge labeled "2d wk." Add lime water until the upper level of the mixture reaches the horizontal line, 17, on the lime-water column labeled "2d wk." Adds 5 1-4 teaspoonfuls of sugar of milk. Add cold boiled water until the upper level of the mixture reaches the horizontal line, 18, on the boiled water column labeled "2d wk."

Replace cover on the bottle, shake thoroughly, and place on the ice in a cool place until ready to use.

If so desired, the milk as modified may be pasteurized or sterilized.

The time it takes to modify one quart of milk as above described is from one half to one minute.

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## Editorial.

### PHYSICAL THERAPEUTICS IN DERMATOLOGY.

THE progress in the employment of physical methods in the treatment of cutaneous affections promises a more general awakening to a sense of their value in the treatment of allied diseases.

The increasing acceptance of the fact that the X-ray has a powerful control over heretofore stubborn diseases of the skin, and the extensive publication of the Lane lectures, in which Malcolm Morris made such favorable mention of the Finsen light, have done much to break down prejudice and bring progressive men to a recognition of newer and better methods.

An able dermatologist, who once wrote that "drugs are by far the most important of the means at our command," has since said that if the choice lay between the *Materia Medica* and the forms of electrical administration in the treatment of cutaneous disease, he would choose the latter.

Another eminent teacher of dermatology places physical exercise and bathing in the front rank as therapeutic measures in these affections, and adds, "It is a severe reflection upon the medical practice of the present day, but it is nevertheless a fact and one well worthy of thoughtful consideration, that many patients suffering from chronic eczema and psoriasis, would recover sooner under the strict regime of an athletic trainer than in the hands of an inveterate pharmacophile, whose idea of cutaneous therapeutics has never reached beyond the narrow confines of Fowler's solution and a frequent change of ointments."

That exercise, dry hot air, light, and the proper administration of high-potential electricity in various ways do increase metabolism—promoting the elimination of suboxidized nitrogenous matter and other effete materials, as well as preventing in large measure the tendency to the processes which assist the accumulation of the irritants which serve to cause external eruptions and other diseased conditions which naturally arise from defective metabolism—is a well-established fact. Excess and errors in matters of diet, the growing tendency to take

less exercise which arises with the conveniences of modern civilization, habits of constipation, alcoholic and numerous other excesses overload the body, and various are the manifestations. Uncleanliness closes one channel of elimination and disposes to absorption and infection.

Exercise induces general activity of all metabolic exchanges, promoting oxidation, secretion, and excretion, with a possibility of relieving the surcharged and overfed economy.

Bathing cleanses the surface of the body, thereby removing excreta and at the same time stimulates normal peripheral circulation and metabolism.

Dry hot air administered to the whole body at temperatures of 300° to 400° F., liquefies some suboxidized, nitrogenous and other irritating accumulations, and induces active secretion and excretion, thereby relieving the system to a remarkable degree of the sources of infection so often the direct cause of cutaneous affections.

Light, in the presence of the atmosphere, promotes oxidation processes, induces functional activity at the surface of the body, and promotes peripheral secretion and elimination, while concentrated light and ultra-violet rays induce active tissue change and destruction of some forms of bacteria, thereby promoting elimination, and stimulating a more normal action of diseased areas.

The X-ray is possessed of properties the action of which is so little understood that it is only possible to study it clinically. It causes contraction of cell protoplasm and diminishes local congestion. When exposures are prolonged dermatitis of different degrees, or necrosis of skin and deeper structures, followed by sloughing, may result. Regulated exposures cause various skin affections to recede and disappear, either by absorption or sloughing, without injury to surrounding healthy tissue, to be followed with healthy granulation and healing with a minimum of scarring. It causes alopecia, and atrophy of the skin, and induces inactivity of the sweat glands when repeated relatively short exposures are made. Its action is therefore unlike all other measures included in the category, and it is employed as other agents which destroy tissue. The action, however, in skilled hands, is to remove only the abnormal tissue elements of low vitality.

Electricity in dermatology has made wonderful strides dur-

ing recent years. The high-potential modalities of the static machine and high-potential coil are invaluable to the dermatologist. The effects upon general metabolism of the static currents probably replace exercise better than any other form of treatment, increasing, as they do, when subnormal, the functional activity of all of the organs of secretion and excretion.

The brush discharge is a specific for treating the local manifestations of a large number of acute and chronic skin affections. These effects are due to the intense vibratory and electrical actions which lessen local inflammatory conditions, induce normal metabolism, and at the same time the ozone and nitrous acid set free with the electrical discharges destroy micro-organisms that are present. The better recognition of these methods, with particular attention to diet and cleanliness, offers the best solution of many otherwise difficult problems in dermatology.

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#### ELECTRICAL NOMENCLATURE.

WITH the steadily increasing knowledge of the various electrical manifestations many workers, scattered in all parts of the world, have contributed to create a confusion of electrical medical terms. For a long time a need for a more uniform and scientific nomenclature of the terms used has been felt. Many expressions used are not distinctive, and the license writers in their employment causes much confusion, and at the same time calls forth adverse criticism from the scientific world.

The committee appointed at the last meeting of the American Electro-Therapeutic Association, Mr. W. J. Jenks, Professor Elihu Thompson, and Professor Samuel Sheldon, are men who can be depended upon to assist in the adoption of a nomenclature which will place electro-therapeutic literature upon the same scientific plane as they and their confrères have placed the great science of electricity. It is hoped that there may be a international understanding upon this important subject, which will unify the world's medical expression in electrical matters.

## **Progress in Physical Therapeutics.**

### **GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.**

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.

ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

*Action of Silver Nitrate and Chromic Acid on Chronic Glossitis, under the Influence of the Electric Current.* By M. L. Ravitch, A. M., M. D., Lexington, Ky., in Journ. Am. Med. Assoc., May 31, 1902.

One is surprised at the number of patients who present themselves for treatment of chronic glossitis with negative results. Under the name of chronic glossitis are included leucoma, leucoplakia, glossitis desiccans, ichthyosis, tylosis or eczema, and keratosis.

Present knowledge of the ætiology of chronic glossitis is so imperfect that therapy for any form of this disease has not advanced proportionately with that of other diseases. In view of the fact that even after the removal of the supposed cause the disease does not readily yield to treatment, I make a suggestion of using fifteen per cent. solution of nitrate of silver or five per cent. solution of chromic acid under the influence of the galvanic current in cases of chronic glossitis. The manner in which I treat my cases is the following: After painting the patient's tongue with a fifteen per cent. solution of nitrate of silver, or five per cent. solution of chromic acid, the patient is told to hold the wet positive sponge electrode in one hand while the negative metal electrode is rubbed over the painted diseased areas for from ten to fifteen minutes; an excess of saliva is produced, and it is caught by the patient or operator holding a large piece of absorbent cotton to the mouth.

I use mostly nitrate of silver, though chromic acid has given me satisfaction. The action of these agents on the tissues under the influence of the electric current may be thus explained: Silver nitrate is first separated into ions, the silver cation, Ag, and the nitric acid anion, NO<sub>3</sub>. The silver ion then goes to the negative pole and separates as metallic silver. On the other hand, the nitric acid ion does not separate as such, but decomposes the water present in such a way as to produce nitric acid and oxygen. Therefore, the cauterizing effects of a solution of silver nitrate under the influence of the electric current are due to nitric acid and active oxygen.

In this connection it would be observed, however, that one

effect of the current is to cause migrations of the ions in opposite directions, the silver ion toward the negative electrode, the nitric-acid ion toward the positive electrode, hence the effects of applying the negative electrode to a surface painted with a solution of silver nitrate, the positive electrode being applied to a different part of the body, is to remove the silver at the negative electrode and drive the nitric-acid ion deeper and deeper into the tissues where it acts upon the water in the manner above indicated, forming nitric acid and oxygen, hence we would be led to expect better results from the application of silver nitrate in this manner than from the usual method.

In the same way when a surface of the body is painted with chromic acid and the current applied, keeping the negative electrode on the part painted with chromic acid and the positive on some other part, the chromic acid is resolved into its ions, the hydrogen ion, H +, and the negative ion, CrO<sub>4</sub><sup>-</sup>, would at once migrate, the former to the negative, the latter to the positive pole. Then the hydrogen of the chromic acid is removed at the negative pole, whereas the CrO<sub>4</sub><sup>-</sup> ion penetrates deeper and deeper into the tissues. In the tissues it is decomposed by water into oxygen and chromic acid, which again is acted on by the current in the manner already described. At the same time, however, another action is taking place. The chromic acid ion CrO<sub>4</sub><sup>-</sup>, and chromic acid itself, finding themselves in contact with the tissue, rapidly oxidize it with the production of the basic oxide of chromium, which is green in color.

Pain of which most patients are apt to complain is greatly relieved by galvano-chemical applications, the hyperæmic condition of the tongue gradually subsides, the tissues become more natural, the patches gradually fade away and the tongue assumes its healthy color. From twenty to thirty applications are all that are needed even in the severest cases. Irritant condiments must be forbidden and the digestion attended to.

A curious fact in cases of chronic glossitis is that women hardly ever suffer from this ailment. In conclusion I desire to express my thanks to Professor J. Kastle of the State College for assisting me in investigating the chemical action of the above-mentioned metals under the influence of an electric current.

The following cases form the basis of my article:

CASE I.—Mr. W. F., aged thirty-one; has been under treatment for chronic glossitis (psoriatic form) for over six years, history of specific nature. Did not yield under any treatment. A twenty per cent. solution of silver nitrate was applied with the aid of the electric current; pain and patches entirely disappeared in twenty sittings.

CASE II.—Mr. C. P., aged forty-six; leucoma of the tongue of four years' standing. History non-specific. Discontinu-

ance of smoking and diet did not improve the disease. Fifteen applications of five per cent. solution of chromic acid under galvanic current greatly improved the tongue. Patient, deeming himself cured, did not return.

CASE III.—Mr. G. V., aged twenty-six; eczema of the tongue of two years' standing, non-specific. Ten applications of silver nitrate under electric current were administered. Patient discharged cured.

CASE IV.—Mr. J. R., aged forty-seven; keratitis of the tongue, non-specific, pronounced by one doctor to be cancer of the tongue. Complained of pain and itching. Eighteen applications of twenty per cent. silver nitrate solution under electric current were given. Patient discharged cured.

CASE V.—U. R., aged thirty-two; leucoplakia buccalis, non-specific. Fifteen per cent. solution silver nitrate was applied. After ten sittings, patient did not return, although greatly improved.

[We have in this communication some interesting observations that are quite novel, so far as the editor is aware, and that illustrate the many possibilities that are yet undeveloped in the electric osmosis of various chemicals. The chemical dissociations and anaphoric movements appear to be correctly stated, and must have added therapeutic value to the surface application of the remedies, for the cases were in the main successfully treated. From a theoretic point of view, however, one would be disposed to suggest that better results, gained from fewer applications, would have been secured by driving the bases into the diseased tissue by cataphoresis (positive pole active) than by the anaphoresis, in which the acid ions are driven in. The final result in the cases cited (electro-chemically) was a reduction of silver in the one case and chromic oxide in the other on the surface of the diseased tissue in contact with the electrode, with a tendency to adhere to the electrode itself, rather than penetrate the tissues. A carbon electrode as positive pole would have driven these active bases into the diseased structures, and such an electrode is readily improvised for the tongue by using the carbon plate supplied for cells, or even an electric-light carbon. In Case I. a mercury-covered copper or gold anode would probably have been valuable, owing to the specific history given.

It is to be regretted that the writer applied his indifferent electrode on such a poorly conducting surface as the palm of

the hand, and does not mention the strength of the current employed.]

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*Treatment of Endometritis by Electricity.*

Dr. Geo. H. Smith, Greensboro, Ind., writes on this subject in the Physio-Medical Record, giving an excellent résumé of the method and warmly commending it. Too much stress is, however, laid in this paper on the antiseptic action of the platinum pole positive, intra-uterine, as it has been well established that this effect of a pure anodic application cannot be obtained with less than fifty milliamperes. With weaker currents the employment of a mercurial coating on the copper electrode renders very small currents actively antiseptic.

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## DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D., BOSTON, MASS.

*Treatment of Hemorrhoids by Electricity.* Annali di Elet.  
Med. e Ter. Fis., February, 1902.

The advantages of treatment in these affections by electrical currents of high frequency and tension are set forth by R. Pisani. After reviewing the experiences of other clinicians, the author gives the details of a case so treated in his personal practice, the favorable results coinciding with the apparently invariable success reported from the use of this method. The electrical current was applied daily to the diseased site for from five to eight minutes, the intensity of the current being from a primary strength of two to four amperes. The patient experienced no discomfort from the passage of the current, a sensation of slight warmth at the anal orifice being the only noticeable effect. Abolition of spasm of the sphincter was obtained in a few days, permitting the easy passage of the electrode; sphincteralgia diminished markedly after the first applications and disappeared entirely at the end of ten days; internal and external hemorrhoids, which were numerous and voluminous, gradually became less painful, and they, too, were entirely obliterated after ten treatments. The patient's general health improved steadily during the local treatment, and there has been no recurrence of trouble during the five months he has been under observation.

[This is similar to Dr. Doumer's treatment published in Annales d'Electrobiologie, January, 1901. The current strength must be the primary. The same treatment is mentioned in my article on "Constipation." I have used the treatment with success.—W. H. W.]

*The Cure of Hemorrhoids by Galvanism.* By C. A. Bryce,  
A. M., M. D., Richmond, Va., Southern Clinic, April,  
1902.

Considering the accessible nature of these troublesome varices, and the amenability of them to treatment, it is surprising how many persons are constant sufferers from them by reason of the neglect of measures for radical cure. Of course, in bringing galvanism forward as a remedy, we refer only to the internal hemorrhoid, as the external or mucocutaneous piles should be excised without any parleying or palliative treatment.

The practitioner who does but little work above the sphincter will be somewhat nervous about stirring up unpleasant hemorrhage when he gets hold of these tumors, if he is influenced by many of the descriptions found in the works on this subject, and while the sudden rupture of a hemorrhoidal sac gives quite a gush of blood, it is a matter usually of little consequence and soon over. If there should be a slight arterial supply, the best thing is to stop it and then go on with galvanic work.

We have no desire to disparage the value of the injection method for the cure of piles, for we frequently use it, and in some cases prefer it to galvanism where a patient has any fear or dislike for the current. But usually galvanism will do all that injections will, and will do it better and more safely. The trouble about injections of carbolic acid and other agents is that you cannot do just so much and know that that is all. You may have a larger slough or more inflammation than you wish when you inject a pile tumor. But you can in an aseptic manner coagulate the entire contents of the sac, and leave it to shrink and be absorbed.

In using the electrolytic needle the rectum should be cleansed with an ample injection of warm water and the patient made to strain down and protrude the tumors, or the sphincter should be stretched and the tumors brought down as in other procedures for the cure of piles.

The technique of the operation in the hands of anyone familiar with electro-surgery scarcely needs mention, as it will suggest itself. But for those who will try the method for the first time, we would say that the object is to use the positive current within the pile tumors by means of a needle or needles until the entire contents are firmly coagulated. Select such number of milliamperes or cells as will do this at once. The needles used should be gold or platinum, and from one to four may be thrust into tumor at its base and held there until the pile changes color and becomes hard. Sometimes the introduction of the needle will allow the blood to escape at once. In this case we simply let it out and use one needle and galvanize the whole base of the pile until not a drop of blood escapes.

We give sometimes to keep the bowels quiet for twenty-four hours and then use a warm-water injection for the first move-

ment of the bowels, and usually the case requires no further attention, being well in a week's time.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D., NEW YORK.

*Catheterization of the Ureter and Radiography—Cathétérisme de l'Urétre et Radiographie.* De Illyès, Budapest.

Tuffier first suggested the practicability of inserting a metal guide in the ureter catheter for the purpose of radiographing it. De Illyès claims that he was the first to act upon this suggestion, and reported his results at a meeting of his local medical society, April 13, 1901. In his first case he was able by radiography to exclude the kidney as the source of a tumor which could be palpated in the abdomen, and also to determine the movability of the spleen. In the second case he was thus able to diagnose and locate a renal calculus. The shadow cast by the stone was so faint that it did not attract attention until the radiograph showed that the tip of the catheter was abruptly arrested at this point. Microscopic crystals also emerged through the catheter, and its application allowed the escape of a collection of pus above the calculus, followed by the subsidence of the fever. Small calculi can be made to cast a distinct shadow by exposing only a limited area to the rays, not more than 2.5 cm. at a time, thus excluding the reflected rays. The stones can be located by a radiograph of the catheter as above, and then, by exposing the exact spot, they will cast a good shadow. Displacement of the kidney can also be diagnosed by this means. In one case the catheter was arrested close to the kidney. No fluids escaped and there was no evidence of retention in the pelvis. These findings indicated that the tumor palpated was really in the kidney and that the catheter was arrested by the mass of neoplasm which had replaced the true kidney tissue. In his fifth case a young pregnant woman had noted for two years a movable tumor in the right hypogastrium as large as a fist. It was held firmly by an assistant, and a radiograph of the catheter in the ureter showed that it passed directly into the tumor which was thus differentiated as a movable kidney. The intestines must be thoroughly emptied before undertaking catheterization for this purpose. Illyès administers a purgative two days before and allows only liquid food. He uses a fine silver guide 1 to 3 mm. in diameter, but suggests that all possible danger might be averted by filling the catheter with bismuth instead of using a stiff guide.

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*Absorption by the Bladder. Sur l'absorption vésicale.* T. Barbaroux, Montpellier.

Barbaroux states that the mucus in the bladder interferes with the absorption by the epithelium; any measure which

removes the mucus, irrigation or instillation of a dissolvent, favors absorption. On the other hand, introduction of a substance which precipitates the mucin retards absorption. When the epithelium is altered in its structure, absorption proceeds more rapidly, but simple inflammation diminishes the absorbing power of the organ on account of the enhanced secretion of mucus. The walls of the bladder have no specific absorbing apparatus, but under certain circumstances they allow the passage of some substances, even of the urinary excreta.

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*The Instrumental Relief of Acute Retention from Prostatic Enlargement.* By Wm. T. Belfield.

Belfield summarizes his paper as follows: "1. Acute retention from prostatic enlargement is due to oedema, not a rigid obstacle, in the prostate. 2. This oedema can be passed sometimes by a Nelaton, always by a Mercier catheter. 3. A metallic catheter is curved to traverse the normal deep urethra and is therefore not adapted to traverse the elongated, distorted urethra of the enlarged prostate. Hence it should be used only as a last resort, and then never forcibly. It is understood urotropin or cystogen should be administered at once in all cases of acute retention and continued until the danger of pus infection of the urinary tract has passed."

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*On Cystoscopy, Its Value and Dangers.* Medical Record, N. Y., June 7, 1902.

Frederic Bierhoff states that, in addition to using a reliable cystoscope, much importance attaches to the source of the electrical current. This may be either a dip-battery, storage-battery, or the street current as used for incandescent lighting. A proper rheostat must be connected with the source of the current to regulate the supply which reaches the cystoscope. Examination is more difficult in the male than in the female. It is wise in determining the question whether the urethra is of sufficient caliber to admit of the insertion of the cystoscope, to employ for the purpose of emptying the bladder, a catheter which is slightly larger than the instrument to be used. The bladder should be capable of a sufficient degree of distention for satisfactory illumination. In the male usually 150 c. c. of fluid suffice, while in the female 200 to 250 are better. There is a certain routine of examination which gives the minimum of discomfort and the maximum of information. It is: After turning on the current and being satisfied that the light is of sufficient intensity to permit of clear vision, the lower margin of the sphincter is first examined, then the trigone, and the ureters; these are located and their character and activity, as well as the character of the urine noted, and then the lower

posterior wall of the bladder is examined. Then one of the lateral quadrants in its entirety is completely and carefully examined. Then the upper and anterior wall and, finally, the other lateral wall. Cystoscopy is not always easy, as there may be strictures or spasmodic contraction of the compressor urethrae. The dangers of cystoscopy have been much exaggerated; disasters are due to faulty technique, or carelessness on the part of the examiner. Where a proper degree of asepsis is observed, it should be no more dangerous than catheterization or the passage of a sound. The more intricate and delicate manipulations should be left to the expert, but the simple cystoscopic examination should be within the grasp of every general practitioner.

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*Grippal Hemorrhagic Cystitis.* Gazette des Hôpitaux Civils et Militaires, May 13, 1902.

M. A. Breton reports three cases of this nature. The first patient was a woman about fifty years old. Four or five days after the first symptoms of the disease, the urinary troubles suddenly began. Pain was strictly localized to the vesical region, and was both spontaneous and elicited on pressure. Polyuria, vesical tenesmus, a burning sensation during micturition and finally hematuria appeared. There was neither sugar nor albumin in the urine. The hematuria persisted for three days, but finally yielded to rest and treatment. For twelve days the signs of cystitis lasted. The upright posture or walking aggravated the symptoms. At the end of about nineteen days, the cure was complete. The second patient was a woman of sixty-five years. The hematuria lasted for eight days and was very abundant. The fact that this patient could not stay in bed accounted for the violence of the attack. The third case was a woman of thirty-four. The hematuria lasted for about nine full days, because she was not able to stay in bed from the first. Treatment of these cases consisted in rest in bed, milk diet, emollient drinks, ergotine, hot vaginal douches, suppositories of opium and belladonna for the pain and tenesmus. Benzoate of soda relieves the cystitis.

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## LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D., NEW ORLEANS, LA.

At the recent meeting of the Western Ophthalmologic and Oto-Laryngologic Association held at Chicago, April 10-12, 1902 (Journal American Medical Association, May 10, 1902), a number of papers of interest to the readers of the ADVANCED

THERAPEUTICS were read. Among them may be mentioned a paper by Dr. J. C. Beck, of Chicago, on

Thiosinamin and Electrolysis in the Treatment of Tubal Obstruction—Dr. Beck's observations in treating fourteen cases led him to conclude that without mechanical treatment the injections of thiosinamin did not materially improve the condition; but, after use in conjunction with electrolysis, a simple bougie could be passed with greater ease and inflation was more free and all the cases treated improved in all respects, as regards hearing, tinnitus aurium, general condition, etc. He also says that before using thiosinamin careful inquiry should be made for possible contra-indications to its use, such as existing chronic tuberculosis, malignant tumors, and scars which support the abdominal organs in the abdominal wall, such as are found after laparotomy. The drug may be used with just as good results—though it is not as rapid in its action—by mouth administration as hypodermically.

Value of Electrolysis in the Eustachian Tube.—Dr. Norval H. Pierce, of Chicago, reported twenty cases of electrolysis in only two of which could any results be ascribed to the electric bougie. These were both cases of subacute disease, with recurrent attacks of defective audition and tinnitus, with diminishing intervals, with soft infiltrated membrano-cartilaginous tube near the isthmus. In both of these the benefits to audition and the subjective symptoms were marked, immediate, and lasting, and these results were obtained after the usual method of injection, massage, etc.

He concludes: 1. In sclerotic disease electrolysis is useless. 2. In the great majority of cases of catarrhal disease it has no advantage over other methods of treatment. 3. In a few cases, where there is probably a soft exudate near the isthmus, it may be regarded of value.

Pneumatic Massage in Aural Practice.—Dr. Edwin Pynchon, of Chicago, stated that through its favorable effect upon the cause—middle-ear adhesions, etc.—pneumatic massage is often beneficial. It assists greatly in the correction of itching of the external auditory canal, and is generally instrumental in increasing the secretion of wax when the canal has become too dry, both conditions being concomitant with chronic catarrhal otitis media. Additionally, in hypertrophic cases, inflation by the Politzer method soon becomes more easy of execution.

With reference to the value of pneumatic massage in acute inflammatory troubles of the middle ear, authorities differ. Pneumatic massage has proved of value in suppurative conditions of the middle ear, particularly in cases of long standing, and when employed in addition to the usual line of treatment will often greatly expedite a cure, owing to its mechani-

cal effect in jarring or drawing down discharges from the attic.

The Misuse of Glasses.—Dr. F. C. Hotz, of Chicago, claimed that careful adjustment of glasses for the accurate correction of errors of refraction has achieved so many brilliant results that refraction work is now a very prominent, if not the most prominent, part of ophthalmic practice. But neither science nor common sense can approve the prescribing of glasses for slight refraction errors in cases where the apparent asthenopia is plainly due to conjunctivitis, blepharitis, or other local or general disorders.

Principles of the Treatment of Otorrhea.—Dr. William L. Ballenger, of Chicago, stated that the treatment of suppurative processes of the middle ear and mastoid spaces should be based upon three principles: first, the establishment and maintenance of free drainage of pus and secretions; second, the removal of all morbid material, whether it be pus, débris, or sequestra of bone; third, the maintenance of asepsis of all parts. He discussed the treatment of suppuration limited to the middle ear proper, saying that it might be successfully accomplished by simple local treatment through the external meatus. But as to the middle ear, attic, and antrum, the narrowness of the aditus materially interferes with the free drainage of the antrum, hence treatment through the external auditory meatus is usually inadequate. In a certain number of cases the removal of the malleus and incus, with the drum-head, affords ample drainage and enables the principles of treatment to be carried out. In cases of suppuration involving the middle ear, attic, antrum, and mastoid cells, he said it was often necessary, in addition to other treatment, to resort to the radical mastoid operation in order to eradicate the disease.

Ocular Affections Secondary to Syphilis.—Dr. Randolph Brunson, of Hot Springs, Ark., demonstrated that syphilis is probably responsible for a greater number of ocular affections than any one disease known. Secondary syphilitic ulcers may occur on the eyelids from the breaking down of a gumma originating in the skin or in the subcutaneous tissue and cartilage. The most frequent location of the lesion is in the skin near the lid margin or below the inner canthus, although it may occur on the conjunctival surface of the lid. The conjunctiva is very rarely affected primarily, but inflammation usually occurs when the iris and ciliary body are involved, the edema observed in these cases being caused by an obstruction of the return-flow of circulation.

The lachrymal sac and duct are frequently invaded by syphilis through the nose. In all the cases of stricture of the lachrymal canal, due to syphilis, which had come under his notice, he had always been able to find the cause in the nose.

Syphilitic rhinitis, both acute and chronic, is very common, and when there was great destruction of the nasal bones and membranes, dacryo-cystitis usually occurs, with varying severity. The iris and ciliary body are perhaps more often invaded by syphilis than any one part of the globe, and syphilis is frequently the common predisposing cause of iritis. About seventy per cent. of all cases of iritis are caused by this disease. The author has found in examining the histories of 1500 cases of syphilis, that iritis occurred in over three per cent of all cases.

He mentioned a number of characteristic signs which enable one to recognize the ætiology of this disease, the most conspicuous of which are the papules, small raised masses in the iris, usually not exceeding three in number, and generally located in the pupillary zone, but may be seen at the periphery of the anterior chamber, or elsewhere.

Interstitial keratitis had its origin in syphilis, and in perhaps sixty per cent. or more of all cases of this variety of disease of the cornea it is hereditary. He had never seen a case caused by acquired syphilis, and believes the cases reported as such have simply been produced by iridochoroiditis, which has involved the deeper layer of the cornea. Disseminated choroiditis is caused by syphilis in perhaps eighty per cent. of all cases.

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## CONSTITUTIONAL DISEASES.

EDITED BY FRANCIS B. BISHOP, M. D., WASHINGTON, D. C.

### TOO WEAK TO TAKE ELECTRICITY.

EVERY physician who uses electricity extensively has undoubtedly heard the expression, "My doctor says I am too weak to take electricity," or, "I am too nervous," or "That I should never take electricity, as my heart is very weak." One is inclined to discredit such remarks, and to imagine rather that the individuals making them are prone to nurse their infirmities that they may grow to be admired by others, as they often are by themselves, as we all know there are a few patients who seem to delight in the idea that they are infirm and delicate, who will exaggerate their ailments, and seem happy only when miserable. They are fond of relating their tales of woe to all who will listen, and to tell of the different doctors and remedies that they have tried in vain. These patients will often make the remarks voluntarily, that they are too weak or too nervous to take electricity. This we can understand; but that any intelligent physician of the present day should advise their patients thus is beyond the scope of my comprehension. The progressive physician is the one who consults the electro-

therapeutic specialist and advises these very patients that are weak, nervous, and with weak hearts to place themselves under the care of a skilled specialist. I can only conclude that those who advise their patients against the use of electricity are ignorant of the physics and therapeutic application of this wonderful natural agent, and such physicians, honest and conscientious, in all except investigation, believe that they are advising their patients for the best, whereas they are often depriving them of the only means of cure. A case or two that are now under the writer's care will illustrate. One, a delicate and refined little lady who has been suffering for several years with all the agony of body and mind that attends a condition of nervous and physical exhaustion, has to my knowledge been begging for two years to be allowed to try electricity. Every muscle in her body is now weak and flabby. She is anæmic; her bowels are sore and distended with gas; the heart is functionally weak. She has been kept from electricity by her physician because she was "too weak to take electricity." When she finally came in spite of his advice, he entered his protest by informing other members of the family that she was entirely too nervous for electrical treatment. She feels the benefit of each treatment, and is improving both from the effects of the electricity and the fact that the stomach and system are freed from the nauseating drugs that have been poured into her for years.

Another lady came to my office with fear and trembling, about one year ago, with heart beating so rapidly that I could with difficulty count the pulse. She had exophthalmic goiter of some years' standing, and had been confined to her bed the most of the time for months; she was unable to follow her vocation as teacher, and she was advised that electricity was the most dangerous thing for her in the world on account of the effect it would have upon the heart. As her physician did not help her, however, she became desperate and without regard for his advice sought relief—or death—from electricity. She acknowledged that she was very much afraid of it. A mild galvanic negative current was applied to the cervical ganglia on each side, and the positive pole to the back of the neck—three times weekly. At the expiration of two months she was enabled to resume her duties in the classroom and walk to my office for treatment, a distance of ten blocks. She is still under treatment, but has little or no inconvenience. Her heart's action is full and most of the time regular.

A Catholic divine, suffering from rheumatism of the left hip and knee, in endeavoring to attend to his church duties, slipped, fell, and wrenched the hip, from which he was laid up for several months. He could not lie down in bed on account of the pain and dyspnea it induced. The heart's action was very feeble; in consequence of which oedema of the lower extremities

was very marked. At the same time the brain was so poorly supplied with blood that he would doze while trying to carry on a conversation. He is now under treatment by electricity, and able to get around on one crutch. His heart's action has become normal, the oedema has disappeared, and for several months he has been sleeping naturally in his bed. He has had only electrical treatment. The idea of a person being too nervous to take electricity is too ridiculous to discuss, as the cases of chorea, neurasthenia, mania, melancholia, and all other forms of nervousness are treated and cured constantly by electricity after medication has utterly failed.

In spite of advice to the contrary the noble science of electro-therapeutics is moving onward, curing the weak and the nervous. Functional heart disturbances are cured, for there is nothing in the world that will soothe, strengthen, and tone such conditions and so surely and rapidly as electricity. I can only say to my co-workers in the field, Go on with the good work, for it is a missionary work indeed.

F. B. B.

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## DERMATOLOGY.

EDITED BY ALBERT C. GEYSER, M. D., NEW YORK.

*Local Treatment of Acne.* Burnside Foster, Northwestern Medical Journal:

When comedones are present in large numbers, and the skin is thick and grayish, with little suppuration, thorough scraping with a dull currette is of the greatest service. The skin should first be thoroughly disinfected and, after the operation, washed with very hot water and soap. Sulphur-camphor-balsam-of-Peru soap is one of the best. At home the patient may apply a mild sulphur cream or powdered sulphur during the night. If there is much suppuration the pustules should be opened with an acne knife under strict anti-septic precautions and their contents evacuated; squeezing without preliminary incision leaves a worse scar than when the knife is used. If there is much hyperkeratosis, and the patient's consent can be obtained, an ointment consisting of resorcin and zinc paste, equal parts, may be applied constantly to the skin for four days. At the end of this time the skin is washed with starchy water, and cold cream or glycerin jelly applied. The skin peels off in large flakes, bringing away the horny layer, and in a week the improvement is very marked. This treatment is of course temporarily disfiguring, and compels the patient to retire from view for ten days. A novel remedy suggested for cases with excessive oiliness is gasoline; it removes the fatty matters and diminishes the amount of secretion of the sebaceous glands. Electricity may be used

either to remove deep-seated papules by the introduction of the needle attached to the negative pole, a weak current being passed for a few seconds, or in the form of surface galvanism applied fifteen minutes at a time, to stimulate cutaneous circulation in cases characterized by a thick and anaemic skin.

[The brush discharge from either the static machine or coil condensers has of late been used with marked results.]

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*Acne and Sycomes Treated by the X-ray.* An interesting article in the Journal of Cutaneous and Genito-Urinary Diseases, of May, 1902, by Dr. W. Allen Pusey.

He noted that the tissue of least resistance yields earliest to the X-ray influences. This led him to try this treatment in acne, in which occurred hypertrophy of tissue which was easily affected under normal conditions by the X-ray and caused to atrophy. Of this we have sufficient evidence in the shedding of finger nails, loss of hair, and peeling of the skin—after undue exposure to the rays; we also know that the rays have a certain inhibitory influence in pus formation. Theoretically, therefore, this should be the ideal treatment, and the doctor cites a number of such cases with surprising results. If all electro-therapeutists would arrive at their conclusions by similar methods of reasoning, fewer failures would be reported. The X-ray, brush discharge, or any other electrical measure has its certain physical and physiological action upon tissue normal or pathological, and if we understand this action and know the pathological condition present, a rational line of treatment will suggest itself, but reason, thought, and theory should precede action and application.

A. C. G.

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## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

THE therapeutic properties of the X-ray are rapidly coming into prominence and will soon obtain the recognition they deserve from the general profession.

It is true that the methods are new and not generally understood; besides the X-ray is looked upon as being an agent of so much danger that it must be used cautiously and close observation kept of its effect upon the tissues and the general condition of the patient while under treatment.

In treating cancer with the X-ray there should be established a standard of exposure for general use. We suggest for general purposes that a tube of medium vacuum be placed

about six inches from the nearest surface of the part exposed, and that exposures be made for ten minutes on alternate days until primary or secondary reaction calls for a change.

I notice in the literature cases of the severer forms of cancer in which the patient seems to have improved from the cancer, but died from the sepsis produced from the rapidly disintegrating tumor. If the above can be prevented by proper surgical precautions and the tumor be made to disintegrate slowly or quickly at the discretion of the operator, such results may, we believe, be avoided.

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*X-Ray in Acne and Sycosis.* Journal of the American Medical Association of May 24, 1902.

Pusey reports a number of cases of acne treated with the X-ray with great success, and says there is no other trouble which proves more intractable to other measures than acne. With the X-ray the favorable results produced were in less time and with less unfavorable effects upon the tissue than could be believed possible. He uses very soft tubes and illuminated to a very green color in the tube. He also reports a case of sycosis treated in the same way; after eight weeks a slight dermatitis was produced, and the sycosis began to disappear and made a complete recovery.

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*A Case of Rodent Ulcer of the Nose and Eyelids Treated with the X-Rays.* Reported by Stopford Taylor, M. D., in the Med. Record of June 6, 1902.

The patient was eighty-two years of age and had suffered for twenty years. Under treatment the progress of the case was slow, and at the end of six weeks setback occurred, followed by an attack of dermatitis, which lasted for five weeks, after which the tumor disappeared under the administration of two applications per week.

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Dr. Frank H. Blackmar, in the May number of the American Electro-Therapeutic and X-Ray Era, reports several cases of cancer treated by the X-ray. His conclusions are that the X-ray produces a breaking down of both malignant and non-malignant growths. He regards the waste products from a rapidly disintegrating cancer to be exceedingly dangerous when thrown into the general system, unless the patient is in vigorous health. For this reason he advises that an operation should be performed before the treatment is commenced; when as much of the tumor should be removed as is possible, to avoid the necessity of its being thrown off. He further advises that the breaking-down process should be carried on as slowly as



BY EDWARD MULVANEY, M. D., JERSEY CITY, N. J.

**History of Radiograph:** Taken with Waite & Bartlett twelve-plate Static machine. Swett & Lewis tube; backed 2 in. spark. Distance from tube to plate, 12 inches. Exposure, 1 minute. Developer, Metal-Eikonogen.



BY EDWARD MULVANEY, M. D., JERSEY CITY, N. J.

History of Radiograph: Taken with Waite & Bartlett twelve-plate machine. Swett & Lewis tube; backed 2 in. spark. Distance from tube to plate, 12 inches. Exposure, 1½ minutes. Developer, Metal-Eikonogen.

possible after the course of the disease is checked. He also suggests the use of the static breeze to stimulate secretion and excretion. He thinks the breaking-down process can be so guarded by means of increased elimination that a fatal termination may be avoided.

We believe that the points to which the doctor has here emphatically called attention are of vital importance, especially in aged or debilitated patients.

J. D. G.

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## RADIOGRAPHY.

EDITED BY J. W. HELLER, M. D., NEW YORK.

*Röntgen Rays in the Diagnosis of Intrathoracic Tumors.* By J. Magee Finny, M. D. Dubl.; and Edward J. M. Watson, B. A. Cantab., M. D. Dubl., British Medical Journal, March 15, 1902.

"The diagnosis of intrathoracic disease, it will be readily acknowledged by every practicing and consulting physician, is at all times a matter of clinical acumen; and although it may be arrived at in some cases with comparative ease and by the ordinary methods of clinical examination, in other cases, and especially in those of suspected intrathoracic tumors, it is often one of the most difficult problems presented to the physician, and may be impossible by those same tests.

"Of course there are instances of aneurisms of the arch of the aorta or of malignant disease of the lungs which can be recognized as such with any ordinary care and observation; but even then, while the presence of a new growth or an arterial dilatation is readily made out, the extent and size of an aneurismal sac or the exact site of a cancer must be at best but a question of probability or a bare guess. Then again at times an aneurism may present no physical signs whatever to betray its presence, while, on the other hand, a mediastinal neoplasm may so closely simulate an aneurism in its symptoms as to defy differentiation.

"Any aid, therefore, which can help to clear up such difficulties and remove such doubts, and which can change deductive evidence into demonstrable must be gladly welcomed.

"Such an aid, I believe, we may have in the X-rays. Two cases of aneurism and one of malignant disease occurring within the chest were examined. In all the X-rays were a help more or less in removing doubts and in explaining anomalous symptoms, while in one it was the only means I had of detecting an aneurism of the thoracic aorta.

"And here I gladly acknowledge the able assistance I got from Dr. Edward Watson in the examination of these cases by means of both the screen and the radiograph."

*Sarcoma of the Right Lung.*

C. B., aged thirty, a dressmaker, was admitted under my care to Sir Patrick Dun's Hospital on the recommendation of Dr. Wright, Dalkey, on February 29, 1901. Dr. Wright had treated her for hemoptysis, and recognizing that her symptoms were of an unusual character, advised her being placed under observation and treatment in hospital.

As the diagnosis inclined to the existence of an intrathoracic growth involving the intercostal veins and superior cava, Dr. Edward J. Watson (the officer in charge of the X-ray department at the hospital) took a skiagraph. The result was not, however, satisfactory, as the whole side was more or less almost uniformly opaque, such as might be due to pleural effusion alone. Yet on looking at the picture, an ill-defined mass, corresponding to the deeper shadow in the lower half, could be faintly outlined.

An exploratory puncture was made on April 5, and some clear yellow fluid drawn off. It was then plain that there was, as expected, fluid in the pleura. Thoracocentesis was done on April 8, when seventy-two ounces were obtained by siphon drainage; the first was yellow and clear serum, the latter third was blood-stained. The fluid did not coagulate on standing and presented no inflammatory corpuscles or morbid cells.

A few days later a second tapping was done, and sixty-two ounces were removed; the fluid was straw-colored, with a few flocculi of fibrin in it. It did not spontaneously coagulate.

On the day following Dr. Watson took another X-ray photograph, which demonstrated clearly the presence of a tumor in front of and to the right side of the vertebral column, extending from the level of the fourth rib behind, down to a short distance above the diaphragm, and occupying more than three-quarters of the lung space, and having regard to the persistent dullness in front, it presumably lies nearer the front than the back of the thorax.

*Aneurism of the Arch.*

P. C., farmer, aged forty-two, married, was admitted to Sir Patrick Dun's Hospital on March 21, 1901, with an aneurism of the thoracic aorta, on the recommendation of Dr. John G. Gibbon of Mullingar, County Westmeath.

April 3.—Dr. Watson took a skiagraph, which graphically depicts the aneurism of the ascending transverse and descending portions of the arch.

In the foregoing case the interest is much enhanced by the location of the aneurism by the X-rays.

*Aneurism of Descending Aorta.*

D. M., aged fifty-four, admitted November 23, 1901, under my care. The patient is a flour miller, and had often to lift 20-stone sacks on his shoulder.

Dr. Watson examined the patient by the screen and made out a distinct area of shadow in the region of the descending aorta, and further noticed that it pulsated synchronously with the heart. He then took a skiagraph I exhibit. The aneurism was of the descending aorta, and extended vertically from the third to the fifth rib, and laterally for 2 1-2 inches from the vertebral middle line opposite the fourth rib.

In this case there was a complete absence of all objective phenomena, and the only subjective symptom on which to lay stress was the existence of an ill-defined pain in the left thorax in front, referable to the third rib in the mammary line, and occasionally shooting out to the shoulder.

Now, though the presence of pain as the essential symptom of aneurism should never be overlooked nor made little of, it must be readily admitted that this symptom is not, in and by itself, sufficiently characteristic to justify a diagnosis of aneurism. One is well aware that some patients may, with a moral obliquity and for a certain unworthy purpose, make great stock out of these pains; but, on the other hand, when there is no desire or intention to deceive, cases have occurred which have been made little of by the patient and the doctor alike, and yet have ended fatally by the sudden bursting of an intrathoracic aneurism. In such cases the aid of the X-rays is incalculable, as it converts the possibility of an intrathoracic tumor being the cause of the pain into a certainty.

This it did in my case, where it might be called a revelation, and it did more, for it told me that the tumor was a pulsating one, expanding laterally at each cardiac beat. Of this particular feature Dr. Watson assures me he is as certain as that the heart itself moves with each ventricular systole and diastole. By the use of the screen this is more readily made out, and indeed the print of the photograph shows it as an indistinct and hazy halo surrounding the tumor at its side.

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## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D., NEW YORK CITY.

LIGHT as a therapeutic measure, especially the electric arc, is steadily establishing itself in the confidence of the profession. In the treatment of malignant growths, as well as in the localized skin conditions, specialized by Finsen, the higher, shorter, and irregular frequencies of the Röntgen ray overshadow in importance the lesser energy of light.

The similarity in physical nature, physiologic effect, and therapeutic action of high frequency discharges, *i. e.*, with

vacuum tube electrodes, light and the X-ray must be constantly borne in mind, and the one or the other selected according to the pathological condition to be treated. Where a lesser expenditure of chemical energy will suffice it should be administered in preference to the greater. There is no doubt but that in the treatment of malignant growths and certain skin conditions, lupus vulgaris, for example, the X-ray is the best agent to use, because from the nature of the pathology, a maximum expenditure of the energy peculiar to X-ray and light vibrations is required to influence definitely the retrograde tissue changes.

In meeting the indications for treatment in extensive and inoperable malignant conditions, it is necessary that a long-continued expenditure of the characteristic energy of the chemical rays should be made in order to secure control of the pathological state, and to this end light is not only of value *per se*, but of very great value as an adjuvant to the X-ray.

After an experience of several years with the Finsen tube, it has been discarded as too expensive to operate and as also requiring an undue amount of time both on the part of the physician and patient. As a result of a good deal of experimental work with various forms of electric arc light apparatus, the writer has, with the assistance of the manufacture of marine search lights (Chas. J. Bogue), devised a method of using the true activities of the arc very near its source, of extreme simplicity and inexpensiveness. The beam of light can be used from one to twelve inches from the distal extremity of the mechanism without the intervention of lenses of quartz or glass, or any cooling device whatsoever. A 25-ampere marine search light capable, when adjusted on a short focus, of picking up and observing the maneuvers of a vessel at a distance of 1 1-4 mile, is arranged to use on a long focus instead of a short, as in the above instance. (The term focus in this instance refers to the position of the crater of the arc in relation to the mirror.)

Fig. 1 shows a cut of the apparatus with the glass door which closes the drum, when used as a search light, open. The arc, which is inclosed in this drum of sheet iron, mounted in brass or nickel, has a 12-inch Mangin mirror projector, concavo-convex, at the back of it, by means of which a much more powerful light is secured than would otherwise obtain. The

lamp is of the automatic focusing type. The door is left open during all therapeutic applications in order that the high frequency or chemical rays need not be lost by filtering through the glass. (Glass prevents the passage to a considerable extent of the chemical rays, and should therefore



Fig. 1.

never intervene between the source of light and the patient if it can possibly be avoided.)

For general applications, where large square-inch surfaces are involved, as the chest in pulmonary tuberculosis, for example, the arc should be adjusted on short focus, *i. e.*, with the crater of the arc 5 1-2 inches from the concavity of the mirror. The beam, at from 10 to 15 feet, is 12 inches in diameter and can be projected at will upon any part of the body. The light mechanism is secured to a cast-iron base, and by means of a swivel joint can be rotated in any direction required. By means of another swivel joint the mechanism can be raised or lowered at will, in order that the beam may be directed to any level of the body indicated by the pathology.\* Application may be from 15 to 20, 30 or even 45 minutes in

\* Where an application to the entire body is desired the writer prefers the cabinet heretofore described.

length. It is the exception that the longer exposure is necessary. In an acute bronchial cold, with dyspnoea, constriction, dry and painful cough, a twenty-minute exposure established free respiration, markedly diminished pain, and general sense of relief, which persisted and was promptly followed by loosened cough and free expectoration. Such an application causes considerable redness of the skin, as the thermal and luminous rays are active as well as the chemical rays.

To eliminate the long and low frequency waves, a screen of blue glass, shown in Fig. 1 and separately in Fig. 2 can be placed between the patient and the light. In this way the thermal and luminous rays are filtered out to such an extent that a prolonged application can be borne for any period of time desired.

The use of the screen, however, diminishes the number of the chemical rays. Still, therapeutic results seem to warrant the conclusion that the diminution is not sufficient to interfere with results in general conditions.

The writer prefers the entire radiant energy of the arc, and never interposes the screen save where there is undue sensitiveness of the sensory nerves. Even in very nervous patients the action, as a rule, of an expenditure of this radiant energy is extremely quieting and beneficent.

Attention, however, is particularly called to the arrangement of the mechanism as shown in Fig. 3.

By changing the focus of the lamp from a short to a long one, *i. e.*, from 5 1-2 to 6 or 6 1-2 inches, and by the funnel-shaped lid, made by black Russia iron, the greatest energy of the beam is secured at a distance not to exceed 12 inches from the distal end of the funnel. This is the focal spot. The arrangement of the focus brings the beam down to a diameter of from 1 to 1 1-2 inch, and the funnel of black iron absorbs the heat rays as they impinge upon its

Fig. 2.



sides, while the residual beam of the greatest activity of the arc is projected from the opening upon or into the part to be treated. To such an extent are the heat rays absorbed that the beam can be directed to the area of diseased tissue at a distance of



Fig. 3.

from 1 to 12 inches without the intervention of any filtering or cooling device. In the treatment of unbroken skin conditions, lupus vulgaris and erythematosus, and in the nodules of recurrent carcinomas, a small block of ice may be secured to the skin surface if desired. This will render the part anaemic, both by pressure and cold, and will at the same time filter out the remaining heat rays without interfering with the activity of the chemical rays. In a chronic eczema of the lobes of the ears, a 20-minute application at a distance of 6 inches from the distal end of the funnel was readily borne, however. In mucous-membrane contacts there is no sensation of heat at all.

This arrangement of the arc light mechanism has been found extremely useful in treating a case of inoperable cancer of the uterine neck, involving both posterior and interior vaginal walls, and also with infiltration of both broad ligaments. It has been used in part independent of and in part as supplementary to treatment by the X-ray. In each instance it is the chemical action induced by, on the one hand, the ultra violet or light vibrations, and, on the other, the ultra-ultra violet or X-ray vibrations. From the very nature of the pathology it follows that a prolonged expenditure of the light or X-ray vibrations is desirable. Thus far experience teaches us that prolonged applications of the X-ray are to be avoided, because of the danger of too extensive action upon the tissues. This is not true of light energy.

The patient is placed upon an operating table in the usual dorsal position for treatment. A glass speculum, funnel-shaped at its proximal end, the funnel painted black or with mirror finish, is then introduced. (Glass shields to a certain extent from the chemical rays, but only in this instance the lower vaginal walls, which are not implicated, and the opening at the distal end secures the greatest expenditure of energy at the point of greatest pathological activity.)

The operating table is then wheeled sufficiently close to the arc light mechanism to permit the distal end of the funnel-shaped lid to project into the flare of the speculum, at a distance of from 6 to 8 inches from the introitus. The light is then turned on and the full force of the beam is projected directly into the vagina and against the exposed cervix uteri. An oblique position of the speculum brings into view the area of diseased tissue in the right fornix. A daily application, 20 minutes in length, is made, sometimes following the X-ray and sometimes alone. There is neither pain nor discomfort, save from the prolonged dorsal decubitus upon the operating table. The whole vagina glows with violet light, but the full force of the chemical rays impinges upon the cervix uteri and vaginal vault, while less directly they must influence the broad ligaments.

In instituting treatment in this case, light was used prior to the X-ray, and from a single application hemorrhage was controlled, odor markedly diminished, amount of discharge lessened, and the character changed for the better. The

patient has now been under care three weeks. There is a marked general gain, characterized by improved color, slight gain in flesh, increased strength, better spirits, disappearance of languor, continued lessening of discharge, no characteristic odor, no hemorrhage save that due to instrumentation, and marked improvement in appearance of cervix and adjacent tissues, characterized by softening of the indurated and nodular tissue. The vaginal mucous membrane has assumed a much more healthy appearance. No opinion is offered as to the future progress of the case.

By this simple device a single mechanism can be made to answer for both general and local applications, and for the latter without the use of tubes, condensing lenses, or cooling devices. To recapitulate; in mucous-membrane contacts no sense of heat is experienced; in skin contacts none at the maximum distance, 12 inches, and but little at 6 inches—none that cannot be eliminated by the use of ice pad.

This detailed description is presented because unity and simplicity of mechanism are greatly to be desired in light therapy.

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

*Concerning Hot Air Apparatus and Hot Air Treatment.* By Dr. Julius Schriber, Zeitschr. f. Diätet. u. Physikal. Therap., 5, 2, 1901, p. 104.

The author discusses the hot air apparatuses that have gained vogue of late, especially the types known as Bier's, Tallerman's, Frey's, and Krause's. It is usually stated concerning these that they enable one to raise the temperature of the air within the apparatus to from 120° to 150° C., and that the human skin is unusually tolerant of heat thus applied to large segments of limbs.

An extensive series of temperature measurements conducted with a Krause hot air apparatus convinced the author that in the first place, owing to the method of construction employed in these appliances, the temperature indicated by the thermometer which penetrates into the cavity of the apparatus is not really the temperature of the air that comes into contact with the limb encased therein, and in proof of this the author shows that different levels of the cavity show greatly varying temperatures. Owing to the presence of constant currents within the air of the cavity the temperature is not evenly distributed. The thermometer indicates relatively higher

temperatures, and so the treatment which is supposed to be given at  $150^{\circ}$  may in reality be only  $60^{\circ}$  C. Secondly, his investigations have shown that the statement as to the peculiar tolerance of the skin for high heat applied for hours cannot be considered as proved, though he does not deny the possibility of such tolerance with practice and under certain favorable physiological conditions.

The necessity for such high temperatures for the attainment of the aims of heat-therapy is vigorously denied by the author, who attempts to show that neither hyperidrosis nor hyperæmia are promoted by excessive heat, and reminds us that the basis of the action of the hot air treatment lies after all in local, or at least supposedly local, hyperidrosis and hyperæmia. Both these phenomena depend not upon the temperature, but upon the stimulus given the sweat glands on the one hand and the vaso-dilator nerves on the other, by the hot air. The dryness of the skin caused by high degrees of heat cannot be proved to be due to more rapid evaporation of the perspiration.

In closing, the author says that he does not by any means deny the value of hot air treatment, but that he simply wished to point out certain fallacies in connection with the use of the apparatus now employed.

Dr. Schreiber's observations are very significant and valuable as indicating peculiarities of the particular makes of hot air apparatus that he mentions, but these conclusions cannot be applied to all makes. We have conducted measurements of the same character upon machines of American make and have never found the thermometer readings at different levels and locations to vary more than ten per cent. with the body apparatus, or fifteen per cent. with the local machine, after the apparatus had become properly heated. Usually the variation has been less than this. The simpler the construction of the apparatus, the less will the heat tend to uneven distribution; the convection currents, when unimpeded, serving the purpose of equalizing the temperature with great efficiency.

His declaration of doubt as to the tolerance of the skin for high degrees of heat does not seem to us to be based upon tenable premises. We have given thousands of hot air treatments, with the skin properly protected by Turkish toweling to secure rapid vaporization of the profuse perspiration, at a temperature of from  $350^{\circ}$  F. to  $450^{\circ}$  F., and the patients expressed nothing but the utmost satisfaction during the entire treatment. If rapid vaporization of the perspiration is not provided for, the skin will of course exhibit intolerance of anything like a high degree of heat; that, however, is because the sweat is remaining upon the skin long enough, and in sufficient quantity, to boil and blister. It is not the intensity of the *dry* heat that produces the intolerance. We have never observed that any particularly "favorable physiological conditions" were necessary in order that a patient should be per-

fectly tolerant of a hot air treatment at a temperature of 400° F.; only a reasonable degree of good technique on the part of the operator.

The statement that "The basis of the action of the hot air treatment lies in the production of local hyperidrosis and hyperæmia" is also not entirely in accord with the bulk of the phenomena that have been observed by those who have had large experience with this agent. The majority of the most desirable effects producible with it are of local origin only indirectly, the mainspring of the action being the physiological activity of the deep spinal nerve centers dependent upon thermic stimulation of the nerve endings in the skin; as witness the enormous increase in the excretion of waste products of metabolism observed after a properly given body treatment, for instance.

In reference to Dr. Schreiber's belief that "The dryness of the skin caused by high degrees of heat cannot be proved to be due to a more rapid evaporation of the perspiration," we would say that it has only been in a few cases of infectious disease and two or three of advanced nephritis that we have ever seen the skin remain dry while a hot air treatment was being given, and we regard such cases as being sufficiently rare to merit the term of clinical curiosities. With exceptions so few that they may safely be entirely disregarded as far as bearing upon the general subject is concerned, a patient perspires more and more freely the higher the heat is pushed, and it is this progressive increase in the perspiratory function that renders it impossible to treat with high degrees of heat without coverings which will facilitate the vaporization of the sweat.

Finally, the advantages, "for the attainment of the aims of heat therapy," contingent upon the use of the higher over the lower and medium degrees of heat intensity, can be appreciated fully only by those familiar with the agent. Suffice it to say that they not infrequently represent the difference between success and failure, that the higher degrees are usually much more efficient in removing nearly all pathological conditions, and that the patient to whom they cannot be applied with safety and comfort is a very rare phenomenon, when proper technique is employed.

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### THERAPEUTIC EXERCISE.

EDITED BY WATSON L. SAVAGE, M. D., NEW YORK.

*Misapplied Mechanical Support to Weak Ankles of Children.*  
By H. Augustus Wilson, M. D., of Philadelphia; Clinical Professor of Orthopedic Surgery in the Jefferson Medical College; Orthopedic Surgeon to the Philadelphia Hospital (from *Annals of Surgery*, March, 1902).

The following conclusions are worthy of consideration in the treatment of weak ankles:

The natural human foot best performs its functions when it has been freest from restraint.

The natural foot can be quickly crippled into inefficiency by high-counters, corset-shoes, arch-raisers, wedges, and elastic anklets.

The natural foot, when burdened by misapplied mechanics, is rendered weak, and therefore susceptible of sustaining injury, such as sprains and the formation of bunions, flat feet, wobble joints, etc.

The natural foot in a constitutionally weak or rachitic child may demand mechanical aids specially adapted to the individual requirements and peculiarities of the case.

That it is the duty of the medical profession to discourage the indiscriminate use of high-counters, corset-shoes, elastic anklets, arch-raisers, and sole wedging, which are known to be injurious, unmechanical, and productive of permanent loss of function.

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*Physical Culture in Italy*, British Medical Journal. Abstract from the Boston Medical and Surgical Journal for May 22, 1902:

The Royal Commission, consisting of Professor Angelo Mosso, chairman, Deputy Luigi Credaro, and Commendatore Gennaro, appointed by the Italian government some time ago to investigate the means of improving physical training in Italy, has finished the first part of its labors. In their report the commissioners unanimously recommend that the Minister of Education should order an inquiry into the existing conditions of physical education in Italy. They have drawn up a schedule of questions to be sent by the minister to heads of institutions, asking why effect has not been given to the De Sanctis law of 1878, which made gymnastics compulsory. The commissioners also call the attention of the minister to the fact that the law of 1878 no longer corresponds to the standard required by the progress of medicine, hygiene, and social pedagogy. They lay stress on the need for new legislation, as in the old law there is no provision for the physical education of the people. They urge that Italy should follow the example of other civilized nations, in which universities are the most active centers for the development of physical education. They propose that every pupil should have a book in which his physical condition at different periods may be recorded. This is necessary in view of the ordinance making gymnastics compulsory, and as a means of prophylaxis against infectious diseases, and obtaining a better knowledge of the physical development in youth. The commissioners further urge that the government should exercise a more active supervision over physical education in private schools, and suggest that strict rules should be established as to meals

and other things connected with the maintenance of health in schools.

[It is to be hoped that Italy, in making her final demands, will not fail to provide for the proper education of the directors of this most important work. We in America are still suffering from lack of qualified teachers, especially men.—ED.]

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*Abstract of the Treatment of Lateral Curvature*, from the Charlotte Medical Journal, April, 1802.

Young (Philadelphia Medical Journal, February 22, 1902) states that any form of lateral curvature which may be benefited at all by treatment is best treated by light gymnastic exercises. The introductory part consists of light exercises taken in the horizontal position lying on a table. Special attention is given to breathing exercises. Weak muscles are developed by exercises adapted to them individually or collectively. The weak muscles are slightly overdeveloped by first finding the best voluntary position which can be assumed by the patient and then taking all the exercises in that position. Special attention should be paid to the development of the lower extremities. The greatest care should be observed and the patient ought always to be under the observation of the surgeon. The treatment should be given daily for periods of from three to six months. Those exercises which are found to be the most useful should be used, supplementing them from time to time with others. He approves of daily massage after the exercises. This should be of several different movements intended to improve the weaker muscles, to divert the blood from the spinal column, and to rest the patient after exercises. The exercises should be taken daily except Sundays and during the menstrual period. The exercises may be modified during the summer. The exercises may be discontinued at this season. These patients should not go to school, nor should they go out in society, as these duties interfere with the proper amount of rest. The morning of each day should be devoted to treatment, and at least two hours in the afternoon should be spent in the prone position. Late hours should be forbidden. All games which employ one side of the body more than the other are also to be forbidden.

[In the treatment of lateral curvature by Dr. Young, in which he claims light gymnastics to be the best and development of the lower extremities most important, my experience and observation lead me to follow a different course, namely, begin with light gymnastics, as rapidly as possible advance to heavy gymnastics, and to the development of the trunk and

upper body rather than the legs. To explain myself more clearly let me define light and heavy gymnastics.

Light gymnastics are such movements or exercises as are taken when the body is the fixed point and the weight the instrument or part moved. Under this head will come all free hand movements, exercises with clubs, dumbbells, wands, pulleys, etc. Heavy gymnastics are all movements where the body is the weight handled and the apparatus upon which the exercise is taken is the fixed point, such as ladders, rings, bars, etc. Under this classification the patient should be advanced as rapidly as possible from the first to the latter, not, of course, giving up the postures, and adding pressure and counter pressure. Too much attention cannot be given to the general hygienic care such as here suggested, but also including the nutrition. During the summer all general games out of doors and great activity are recommended whenever possible.—ED.]

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## SOCIETY MEETING.

### THE FOURTH REGULAR MEETING OF THE CLINICAL SOCIETY OF THE NEW YORK SCHOOL OF PHYSICAL THERAPEUTICS,

Held at the school Friday evening, May 16, the President, Dr. Robert Newman, in the chair.

Dr. William Benham Snow presented two cases of Epithelioma:

CASE I.—A small epithelioma upon the nose, which had been present for ten years, had been diagnosed at the Vanderbilt Clinic as malignant. The growth was treated for three months by three exposures weekly of the X-ray, and had now remained cured for four months.

CASE II.—An extensive epithelioma of the neck, had been treated on alternate days, having been rayed in all eight times, when the static brush discharge of negative insulation had been applied three times weekly, under which treatment the surface had healed over as shown. The conclusions to be drawn from these cases were:

1. That cases which are relatively insignificant may require months to effect a cure, while others covering considerable surface are promptly healed.

2. That in certain cases the static brush discharge associated with raying was instrumental in hastening recovery.

Dr. Geyser then read a paper on "The Treatment of Lupus Vulgaris with the Static Spray and Brush Discharge."

At the close of the paper the speaker showed a shield of thick rubber which he employed when using the X-ray. He stated that it was suggested to him from the fact that when making X-ray examinations of fractured limbs in which splints were secured with strips of rubber plaster, a degree of



Case I.

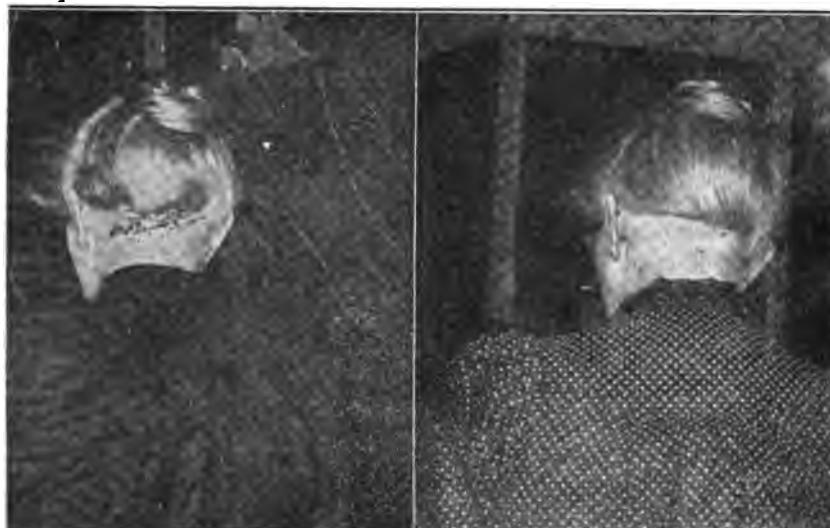
opacity was well defined where the plaster covered the arm and splint.

Dr. Josephine Davis expressed satisfaction with the paper of Dr. Geyser, and stated that she had had remarkable success with freshly prepared methyl violet in the treatment of superficial epithelioma. She had successfully healed numerous cases. It seemed in many ways to act like the X-ray—relieving pain, removing fetid discharge, and inducing healthy granulations. Solutions should be freshly prepared and applied in fifty per cent. solution to open surfaces. It produced a burning sensation when applied. It was spoken of as a pus destroyer.

Dr. Snow said that the static brush discharge of negative insulation employing electrodes of wood offered much in the treatment of lupus vulgaris, as well as in many other stubborn skin affections. The case of lupus vulgaris reported by Dr. Gibson of Birmingham, Ala., in the February number of *ADVANCED THERAPEUTICS* is confirmed by the experience of Dr. Geyser. If this method did not supersede the X-rays, as

the latter had the Finsen light, it was certain to form a valuable adjunct to other forms of treatment. The paper will do much towards establishing what will be known as the American method of treating lupus vulgaris.

Dr. Newman said that he could testify to the value of the brush discharge from the maple stick in the treatment of other affections, but not of lupus. He thought that Dr. Geyser's paper with exhibition of cases established the method in the



Case II.

rôle of efficient means of treating this heretofore stubborn affection.

A discussion on the Treatment of Malignant Disease by the X-ray was opened by Dr. Clarence E. Skinner. He said:

Mr. President, Ladies and Gentlemen: In the last four months I have had under treatment forty-one cases of cancer by the X-rays. I did not expect to address you to-night, so shall have to ask your indulgence if my data are a little imperfect. I shall be glad to have anybody ask any questions.

Of these 41 cases 18 are of internal cancer, the greater number of which have started in the uterus and spread throughout the abdominal cavity; 6 are in the breast, and 17 are of the external variety; 6 of the total number have been cured. I think it is positively demonstrated now that external cancer is curable by the X-rays; if not by the X-rays alone, by the brush discharge in combination with the X-rays. All of my cases of external cancer so far have responded, and are responding very nicely, to the X-ray alone.

The cases of internal cancer give us a more difficult problem, but I think it is demonstrated beyond a doubt that we do secure effects upon internal cancer. In all cases of internal cancer which I have treated, except two, the pain has gone after from one to three treatments. In the two I refer to, relief became complete after the seventh or eighth treatment. The discharge in all except these two cases has been markedly lessened, and in two or three instances entirely done away with. I recall one case in particular, where, when she came under treatment, she was unable to get out of bed at all, and had not been able to sit up long enough to eat her meals for several months. Within three weeks she was entirely free from pain, and walking about. The discharge became merely a trace, and she had gained five pounds in these three weeks. Two cases of internal cancer have died of asthenia. These cases were both hopeless when they came under treatment, as most of these cases are, but even then the pain was relieved and the patients were made comfortable while they lived.

I think it is desirable to get a little dermatitis in some cases. I have found a number of external cases, which would not respond at all until a slight amount of dermatitis had been set up; then they came along very fast. I have had several cases which would not respond at all to treatment, even after a dermatitis had been set up, and then, after drooping treatment altogether for three or four days, they would begin to improve rapidly and suddenly. I had under treatment an old lady over eighty, who had an epithelioma on one side of the face, and I gave her eight treatments without any apparent results; then treatment was stopped for a week, and when she called again at the end of that period, three-fourths of the area had healed over, and she is now well. I think that the use of the coil is preferable in those cases where you want to produce a dermatitis. It is a well-known fact that X-rays excited by a coil current burn very much more easily than when a static machine is used. When a superficial case is not improving under moderately long exposure when a static machine is being used, it is a good thing to shift to a coil, but I have not so far discovered a condition aside from this where I thought the coil equal to the static machine.

In the matter of frequency of exposures, it is a puzzling problem to know just how frequently to expose a patient. We know that the X-rays sometimes burn readily, and are pretty treacherous, and that it sometimes takes two weeks for an X-ray burn to develop. I think we shall be well within the limit of safety if we expose a patient every other day for the first two weeks. This will give us a pretty good idea of how susceptible the skin is to the ray. If no dermatitis is evident at the end of this period, the exposures may be made every day for four or five days. Then they should be sus-

pended for four or five days. I am confident that it is necessary to be careful, as a burn is apt to develop rather suddenly. I think with the anode of the tube at a distance from the skin of the patient of ten inches, a fifteen-minute exposure with the static machine or one of ten minutes with a coil, is very easily within the limits of safety, and I have never seen any evil or uncontrollable results follow that length of exposure in the fifteen hundred odd treatments which I have given.

In breast cases I think surgery is going to be of use in connection with the X-ray. My experience with breast cancers has not been overwhelmingly encouraging, only about fifty per cent. of the cases so far being satisfactory. None of them have yet been entirely cured, but three are making very good progress, the other three have not moved at all, although the growth is not progressing. In these cases of cancer several axillary glands are very much involved and are very hard, and it has occurred to me that it might be a good plan to remove the breast and axillary glands and then begin to ray the patient immediately after the operation. That is the procedure which I shall probably adopt ultimately in these three cases.

I had one very interesting case which I discharged three weeks ago, and which shows what X-rays will do in the way of removing malignant growths. The patient was a man, forty years of age, who came to me with a mass as large as my fist, in the neck under the jaw, extending down into the mediastinum. He had been to see two Boston surgeons and they had refused to operate, as he was a hopeless case. He came down to me and I started in with the X-rays about three months ago. There was no apparent effect produced upon the tumor for about one month. Suddenly it began very rapidly to disappear, and there is now no trace of it left. It is an unusual thing for even the X-rays to produce absorption of such a large malignant growth in such a short time.

The Matter of Tubes.—I think in all tumors or growths which extend three-fourths of an inch below the surface we ought to use high vacuum tubes, but I do not think in very superficial growths that it makes so much difference. In fact, in these cases where we want to produce a little dermatitis, a low tube may be more desirable, because it will burn more easily. It has seemed to me that superficial cases do not respond to high tubes as they do to low tubes, but the line of evidence on that point is not yet extensive enough to be at all convincing. For deeply seated neoplasms there can be no doubt that high tubes are necessary.

In conclusion I want to say that I think it is most desirable for all of us who are doing any work on these lines to keep careful records from week to week of the progress of the cases. We are going through a period in the history of the treatment of malignant diseases of extreme importance. A

revolution is in progress in the treatment of the most dreaded disease we have to contend with, and it is extremely desirable that every bit of evidence be preserved. We should keep a record of our failures, and the conditions under which they occur, just as conscientiously as we do of our successes; every case is of great value, and we want to find out just where we stand in the matter. It does not seem possible, until one has seen it, that any measure apparently so simple as X-ray exposures should be capable of producing such profound results in a disease which it has hitherto been almost impossible to get rid of by any means. At the present time, however, there is enough evidence at hand to prove undeniably that, in many cases at least, we have in X-light a measure which will remove one of the most horrible of diseases, with perfect ease and without even producing discomfort on the part of the patient.

Dr. Robert Newman: Being on the programme for discussing the treatment of malignant tumors by the X-rays, I have to state that I have had considerable experience in that line, partly from my own cases, and partly from observation of the practice of others. The record of Dr. Morton is convincing. Dr. C. Allen read a paper before the New York County Medical Association relating his success in many cases, and exhibited fifteen patients, demonstrating thereby the cure of malignant tumors by the X-rays. Dr. Skinner's cases are remarkable, and his paper on this subject speaks for itself. This institution has done noble work, and Dr. Snow is working daily and has achieved results which are better than any other method, of which some were in the beginning almost hopeless.

Among my own cases one is particularly remarkable, an orbital tumor, a sarcoma, which had developed after the removal of a polypus from the nares. The gradual growth of the tumor had pushed the eye forward from its socket. This patient was exhibited a month ago by me in a medical society, and the whole assembly pronounced the case to be fatal; some predicting that his debility would be so great that in three days he would not be able to come for treatment. It is an orbital sarcoma, extending to the superior maxillary bone. The optic nerve is gray—undergoing atrophy. Vision of the left eye is destroyed. On that occasion, Dr. Beiser, who is present here, saw him at the society, and I hope he will make some remarks on the case. At present, after three weeks' treatment with the X-rays, the patient is much improved, the tumor smaller, his countenance brighter, the complexion more normal, his weight increased, and his vitality so much returned that it is no effort for him to come for treatment and even transact some business.

Dr. Bieser: I can testify to the truth of the remarks made by Dr. Newman in regard to this very interesting case. The

general consensus of opinion at that meeting was that the man's days were numbered. If the improvement is as marked as Dr. Newman states it to be this evening he has achieved a wonderful result with the X-ray, which new method promises to revolutionize our treatment of cancer. I was edified and instructed by the remarks and practical demonstration of results made here this evening: for practical results after all outweigh all the most learned disquisitions *pro* or *con* on the interesting subject of the X-ray. Apropos of curable diseases, there is no fact more firmly established in medicine than that the physiological economy is perfectly adequate to cure its curable diseases, provided it is not hampered in its benign fight to ward off disease and to eliminate the *materies morbi* after it has gained a foothold in the body. Apropos of incurable diseases where the economy *per se* is inadequate to effect a cure, it seems to me that in such diseases as lupus vulgaris and cutaneous cancer the X-ray is the agency pre-eminently fitted to cope with the *materies morbi*, for by directing the X-ray energy solely on the pathological areas, and by making provision for adequate protection of the healthy tissues by Dr. Geyser's rubber shield, we assist and do not hamper nature in its benign fight to throw off the disease.

X-ray chronology, teeming as it does with reports of the efficacy of the X-ray by competent and reliable observers, teeming as it does with records of practical demonstrations of case after case cured by the ray, must necessarily relegate the *cum grano salis* argument to the rear, at least so far as lupus vulgaris or cutaneous cancer is concerned.

As regards the question of inoperable cases said to be uninfluenced by the X-ray, if we take as the test of cure the three-year limit that is still *sub judice*, the very facts that operation is often futile; that pain is almost invariably relieved by the application of the ray; and that growth of the cancer is often arrested, even if not radically cured, justifies any doctor in its use.

Dr. Skinner: In connection with these remarks I would say that I have now under treatment a case of precisely the same character as the one just referred to by Dr. Newman. The disease started from a nasal polypus and passed into the orbit. The man came to me six weeks ago and the eye was more than half extruded from the socket by the tumor. At the present time he has been rayed three times a week, and the eye has gone back so far that it is only at times that any protrusion is markedly observable. The condition of the nasal canal is much improved, so that the patient breathes through the nose with absolute freedom, whereas he had only breathed before with difficulty. There is almost no evidence, so far as the outward appearance of the patient is concerned, that there is anything the matter with him. The pain is stopped, the ap-

petite has returned, and in other respects he appears entirely well.

Dr. William Benham Snow said that he had seen the case reported by Dr. Newman, and could confirm the report of improvement.

He wished to call attention to the occurrence of sloughing which takes place in most if not all cases where the tumors are of considerable extent. Not only does this take place in external growths, but it has also been noted in a large sarcoma of the face where sloughing took place within the mouth, also in carcinomatous growths within the larynx, and in a case of cancer of the stomach there was also suspicion that sloughing took place.

I believe (1) that the effects of the X-ray upon normal tissue are, first, to stimulate normal activities, due to the vibratory effects of the rays or of the ether in the presence of the rays; (2) that these effects with short exposures with high vacuum tubes induce activity of normal tissue cells, which in some cases supplant abnormal tissue elements without evidences of disintegration; (3) that longer exposures destroy the abnormal tissue elements of low vitality, but do not affect normal tissue unless the exposures are too prolonged; (4) that abnormal tissue elements thus exposed break down, and disappear through the natural channels of absorption or by sloughing.

In some internal cases, and frequently in external tumors which are breaking down, there are strong evidences of auto-infection associated with marked fever, occasional chills, and a varying degree of prostration, which will rarely prove fatal, except in patients who are feeble from age or exhausting causes. Nor should a possible fatal termination deter us from the employment of the rays, because in these inoperable cases the only hope resides in the use of the X-ray, which relieves pain, destroys fetor, and may possibly restore the patient to health. Should, on the contrary, death be hastened by auto-infection, may it not be deemed a mercy? The use of the rays in the treatment of a large variety of cases, internal and superficial, justifies, we believe, the following conclusions:

1. All inoperable cases and every superficial cancer should be treated by the X-ray. The inoperable cases, because of the relief afforded, and the fact that success has already been achieved in so many where the outlook for recovery was hopeless. The superficial cases should be treated by the X-ray because from operative procedure they almost invariably return, while to the present time the rays promise more.

2. All cases which are operated upon should be subsequently rayed upon alternate days for periods to be determined by various indications.

3. Observation derived from the treatment of numerous recurrent cancers of the female breast justifies the statement that

if the surgical procedures are carried out in conjunction with the Röntgen ray in cases of small tumors it is no longer necessary to remove the entire breast, and removal of the lymphatic glands in the axillary space may in most early cases be dispensed with. And no operation should be performed until the rays have first been employed.

4. Where extensive tumors are present in bone or soft parts, in regions where surgical operations will with safety remove the whole or a large part of the mass, it is advisable that it be done, and that the operation be immediately followed by systematic employment of the X-rays, that the case be judiciously watched, and upon the slightest evidence of a return the rays be again employed. Under such regimen the mortality from cancer will be very materially reduced.

Dr. Mitchell: In listening to Dr. Snow's remarks on auto-infection the thought occurred to me that the auto-infection might happen as the result of there not being sufficient drainage. If that is the case, why not make an opening into the cancer and pack for drainage and prevent this auto-infection? I saw one of the doctor's cases which had sarcoma of the bone; it had sloughed, and it is certainly making wonderful progress towards recovery. Since seeing that case, it occurred to me that an incision might be made and the cavity packed so as to drain it, and thereby overcome the auto-infection.

Dr. Skinner: I think the point brought forward by Dr. Snow is a good one. I have noticed on several occasions chills and fever occurring in the course of the treatment of these large cancers. In three cases which I call to mind these phenomena have been accompanied or followed by sloughing. One of these was a case of sarcoma of the superior maxilla. Masses of dead bone kept coming out of the cavity for a period of three weeks, and at intervals during that time there were chills and fever present. In this case drainage was perfectly free, as there were half a dozen different sinuses opening out upon the external skin and into the mouth, still the man continued to grow worse with symptoms of auto-infection. The other two were uterine, and had chills and fever followed by sloughing of fairly large masses in each case.

I agree fully with Dr. Snow's remarks, and think that we can give patients relief even when the condition is hopeless, as long as they do live, and I think that surgery is going to assume a place in connection with the X-rays in these cases. About sixty per cent. of cases operated upon recur, and it is my opinion that by following operation by raying, even in cases where we know that that operation would ordinarily be followed by recurrence, we shall be able to reduce the total mortality of the disease by a large percentage.

At the close of the discussion the President announced that the Clinical Society of the New York School of Physical

Therapeutics meets the third Friday in the month, and physicians will be welcome to attend, and are invited to become members. There will be interesting cases presented and matters brought before you which will be of interest. This institution does good work, and it is arranged with the intention of giving physicians all over the country and other countries a post-graduate course, principally in Electro-Therapeutics and other physical manifestations which are included in the course of instruction. We have made a good commencement, and are working hard in the beginning and we are prepared to do good work for those who come for post-graduate work. We hope to have this society, the Electro-Therapeutic Society of New York, to bring clinical results before you once a month.

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#### NOTES AND COMMENTS.

A circular recently issued by executive council of the American Electro-Therapeutic Association and committee of arrangements contains the following announcement: The American Electro-Therapeutic Association will hold their Annual Meeting at the Hotel Kaaterskill, Catskill Mountains, New York, on the 2d, 3d, and 4th of September, 1902. Scientific papers, discussion, local excursions, concerts, balls, banquet, special vaudeville. Reduced rates to members, their families and friends.

Route: North Bound, Albany Day Line Boat leaving foot of West Twenty-second Street, at 9 A. M. to Kingston.

Kingston point, via Ulster and Delaware Railway to Kaaterskill, returning; South Bound; Otis Railway, Catskill Mountain Railway to Catskill.

West Shore Railway from Catskill to New York.

Excursion tickets \$4.93, good from 31st of August, 1902, to 5th of September, 1902, can be bought at ticket offices of West Shore Railway, or of Mr. H. B. Jagoe, G. E. P. A., 359 Broadway.

The Arion Singing Society will be at the Hotel Kaaterskill from the 29th of August to 1st of September, 1902.

Members of the American Electro-Therapeutic Association can avail themselves of the special rate given by the hotel during this time.

For particulars write to Dr. Robert Newman, 101 West Eightieth Street, Chairman of Executive Council, or Dr. William Stevens, 70 West Fifty-second Street, Secretary Committee of Arrangements.

Westcott's Express checks trunks from house to Kaaterskill, on presentation of tickets without extra charge.

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## DRY HOT AIR IN THERAPEUTICS.\*

BY CLARENCE EDWARD SKINNER, M. D., LL. D.,  
NEW HAVEN, CONN.

Professor of Thermotherapy in the New York School of Physical Therapeutics, Editor of the department of Thermotherapy in the Journal of Advanced Therapeutics, Physician in charge of the Newhope Hot Air Sanitarium; Member of the American Medical Association, American Electro-therapeutic Association, Roentgen Ray Society of the United States, American Association for the Advancement of Science, Yale Medical Alumni Association, etc., etc.

Dry heat is a therapeutical agent which is but little known to most of you, hence I shall have to treat the subject from a general rather than a technical standpoint. Like all new therapeutical measures it has as yet obtained comparatively little attention from the profession at large, but those of us who have used it more or less extensively have become aware of the fact that the range of pathological conditions, in the treatment of which it constitutes an important factor, is an extended one. In addition to this it accomplishes much of its work in fields which have hitherto been most unsatisfactorily covered by other therapeutical measures, and in many of the fields in which it enters into competition with other methods its superiority over many of them, when skillfully, intelligently, and thoroughly applied, is most evident to those who use it. Professor Wood of Philadelphia made the statement three years ago that the results of hot-air treatments in some conditions were almost miraculous. It is this very property which has been active in preventing hot air from being more thoroughly known by the profession at large, because many of its therapeutical actions have seemed too good to be true. Many of the results obtained have been ascribed to coincidence instead of the use of hot air. Those who use it ex-

\* Read before the Clinical Society of the New York School of Physical Therapeutics, June 20, 1902.

tensively, however, see these results repeated under the same conditions time after time, and it is from a succession of such experiences that we derive our conviction that the agent is one which has come to stay, and the use of which will invade many therapeutical fields in which other measures have proved unsatisfactory in different degrees.

The first question that naturally arises, when a new remedy is introduced to us, is what phenomena does this agent induce in the human economy, and how does it induce them? What is its physiological action? This determined, a knowledge of pathology will enable us to decide to what diseased conditions it is applicable and give us a rational basis for its use. The applications are of two kinds, local and general, and the effects differ in degree, and to a certain extent in kind also.

**Local Treatment.**—The sphere of action of the local treatment is practically confined to the part treated. What slight effects are produced upon the organism as a whole are principally secondary to changes in the disease focus; hence it is not ordinarily capable of curing, unaided, pathology which owes its origin directly to impairment of the central nervous apparatus. For instance, local treatments alone will not cure the joint lesions of *arthritis deformans*, because these lesions are but secondary manifestations of impaired trophic centers. They will in some instances, however, relieve the pain temporarily. In rheumatism, on the other hand,—and by this term I mean true inflammatory rheumatism,—the primary focus of infection is in the joint or points affected, and local hot-air treatments, with appropriate drugs, will usually produce a radical cure. The organism at large will be secondarily benefited during the process by the lessening of depression due to pain, rheumatic toxins, and faulty products of metabolism, in proportion as the local lesion improves.

This therapeutical measure affects physiological function in two ways; first, by a direct stimulation of cell metabolism in the part treated, due to the raising of its temperature *en masse*; and second, by a reflex acceleration of cell nutrition set up by the stimulating influence of the heat upon the numerous nerve endings in the skin.

It is of course not possible to raise the temperature *en masse* of one portion of the body very much higher than that of another portion, but by placing the bulb of a clinical thermom-

eter at the bottom of a deep sinus and then applying a hot-air treatment it has been demonstrated that an increase of several degrees Fahrenheit can be induced; this is enough to accelerate oxidation processes very perceptibly.

In diseases characterized by the presence of pathogenic micro-organisms in the part treated, as local septic infection or pneumonia, the inhibitive influence of this element of the physiological action of the agent upon the growth and activity of the germs, whereby they are rendered more susceptible of attack by stimulated leucocytosis and cell metabolism, is very evident. It has been suggested that the germs in these cases were directly destroyed by the heat. This view, however, is improbable, and there is no experimental or clinical evidence indicating that it is possible to raise the temperature of any portion of the body sufficiently high to produce this result.

Through the reflex influence is obtained an emphatic local hyperæmia, which, together with the stimulation of the nervous supply of the part treated, results in greatly increased local nutrition.

Copious perspiration appears upon the region treated, and in greater or less degree upon the rest of the body. The secretion is strongly impregnated with fatty acids, whatever the disease from which the patient is suffering, or even if he has no disease at all. If a toxin is circulating in the blood, a certain amount of it will be eliminated with this secretion.

To these profound influences upon the circulatory functions of the part, whereby stasis is relieved, is probably due the powerful influence of dry hot air in relieving pain and swelling.

The general body temperature and pulse are but rarely much affected. Patients frequently exhibit an increase of a fraction of a degree in the former, and eight or ten beats per minute in the latter, but nothing to influence the general metabolic functions markedly. That local hot-air applications are sometimes capable of exerting profound reflex influence upon distant parts, however, was demonstrated in a case reported by Walsh. The patient had eczema of both hands; one only was subjected to the treatment, yet both got well. Cases also have been reported where pains in a limb on one side of the body have been relieved while the corresponding limb on the opposite side was being treated.

It will be observed that all of these effects tend to greatly increase the assimilation of remedies in the tissues subject to their action.

Body Treatment.—The physiological action of this measure is predominantly reflex through the spinal sympathetic, the area of skin treated being so great that the capillary circulation is able to dissipate the heat before it penetrates deeply enough to exert its action directly to any great extent, herein differing from the local application.

Microscopical and chemical examinations, made in connection with patients under treatment by the writer, have demonstrated that the following phenomena are susceptible of immediate induction by the body hot-air treatment:

First, the white blood corpuscles are increased in different cases from fifteen to fifty per cent.

Second, the red blood cells are increased from ten to twenty per cent.

Third, the quantity of urine passed in the twenty-four hours succeeding the treatment is usually increased from twenty-five to one hundred per cent. over that passed in the twenty-four hours preceding. In a few instances, however, a decrease in the quantity has been observed.

Fourth, the quantity of urea excreted in the twenty-four hours succeeding the treatment is increased fifteen to sixty per cent. over that excreted in the twenty-four hours previous.

These effects persist, with decreasing intensity, for from four to twenty-four hours, and sometimes longer; the time varying in different diseases and with different patients.

It will be observed from the above that the beneficial effect of body hot-air is not entirely due to the induction of hyperidrosis and hyperæmia, as is frequently stated, but that its influence involves phenomena of much greater profundity than would be explicable upon such an hypothesis.

When we consider the large number of pathological conditions in which the reconstructive functions are deficient, the modifications in the composition of the blood noted above assume an interesting significance; and when we think of the number and variety of diseases which are dependent wholly or in part upon the retention in the system of products of sub-oxidation, the sphere of action of the body hot-air treatment,

as indicated by its effect upon the excretory function, becomes extended within limits of considerable magnitude.

The general phenomena induced by the body application are as follows:

The mouth temperature rises from one to five degrees Fahrenheit, according to the length and intensity of the application, and the susceptibility to stimulation of the individual patient's deep nerve centers.

The pulse is accelerated from thirty to fifty beats per minute, and is markedly increased in volume. If it was weak before treatment, it now becomes strong. If treatment is continued too long, it loses its volume and strength, becoming rapid, small, and soft, but sometimes retains its volume, becoming very soft and slow. Under these conditions the patient becomes dizzy, faint, and nauseated.

The respiration deepens and the rate increases five to ten cycles per minute, but is not accompanied by any oppression—rather the reverse, in fact.

The capillary areas become strongly injected, but this phenomena is not as marked in the regions actually in contact with the heat as with the local treatment. The fact that the capillaries of the face, which is never subjected to the heat, share this general distention, even when constantly under the influence of the breeze from an electric fan, demonstrates the profundity of the reflex obtained.

The patient reeks with perspiration, the acidity of which is markedly increased over that normally exhibited.

The sensation is not disagreeable to the patient, but quite the reverse, usually. A pleasant languor ensues after about ten minutes, and lasts for an hour or two, and the patient usually becomes drowsy and sleeps. If the treatment is continued too long the languor gives place to exhaustion, with cardiac palpitation and oppressed breathing, which sometimes persists for hours. By this profound stimulation of the trophic centers we secure a more rapid and complete oxidation of effete materials which are clogging metabolic processes, into normal excretory products,—urea for the kidneys, CO<sub>2</sub> for the lungs, etc.,—which are then easily disposed of by the appropriate organs; and a rapid production of more vigorous and healthier cell elements, which are much better able than their predecessors to resist toxæmia and microbic invasion. We not only ob-

tain a corrective influence in nutritional disorders whose origin is in the sympathetic, but if the patient is suffering from an infectious invasion we increase vastly the resisting power of his phagocytes and tissue elements. The profuse perspiration carries out with it also a certain amount of ptomaines, and thus assists in relieving the depression of nerve centers due to systemic toxæmia.

The functional activity of every organ and tissue in the body is immediately augmented, but this exaltation of function is not followed by a reactionary debility. Patients frequently continue to improve, generally for months, after a course of body hot-air treatments.

It will be seen that the physiological action of hot air is in line with that of hydrotherapy, electricity, the Turkish bath, and massage, but is under some conditions much more profound than any of them. It is, however, usually advantageous, and, as will be seen later, sometimes necessary to combine electricity with hot air in order to accomplish certain results. Neither alone will do the work of both together. Massage in the same way is sometimes useful, but very rarely necessary.

During the demonstration of the body treatment which will follow the reading of this paper you will have an opportunity to assure yourselves by personal observation that the phenomena which have just been noted are producible by this measure, except the modifications in the composition of the blood and the urine. Blood counts and chemical analyses are too cumbersome to be practicable at a demonstration of this sort, and I shall have to ask you for the present to take my word for the fact that these phenomena are induced.

From a study of its physiological action it will be observed that hot air is applicable to a large number of diseases, but I shall only touch briefly upon a few of the most common pathological conditions in which it is at present of demonstrated value.

Rheumatism is the first disease in which hot air was used, and it is in the treatment of this disorder that it has gained its greenest laurels. One of the most important points to be taken into consideration in judging of the efficiency of hot air, or any other element of treatment in this disease, is the very common error of diagnostinating as rheumatism conditions

due to entirely different causes. Rheumatism has been made to bear a vast deal of undeserved opprobrium. At least three-fourths of the cases which have come under my observation as rheumatism have not been rheumatism at all. Furthermore, many of them have involved the practical point of being disease processes which do not respond to anti-rheumatic therapeutics. In true rheumatism, however, the use of hot air has rescued the disease from the category of those which are most bitterly resistant to remedial measures, and the treatment of it can no longer be regarded as a reproach to the profession. It can now be as satisfactorily and positively cured as any other disease; not excepting malaria,

It is always wise, and usually necessary, to give some salicyl compound with the hot air. This agent will always relieve the pain alone, and some cases are susceptible of cure with it alone, but the salicyl compounds in combination with hot air effect a cure in all cases, and I regard their administration as imperative.

Briefly, the results of the use of hot air in rheumatism are as follows:

First, immediate relief of pain, however severe, which relief may be rendered permanent by repeating the treatments as often as the pain becomes troublesome; every four hours, if necessary.

Second, shortening of the duration of the disease, which usually lasts only from five to ten days when hot air is thoroughly administered in combination with salicylic acid.

Third, lessening of the liability of cardiac involvement because of the rapid control obtained over the pathological condition, whereby the infection is inhibited from further attacks upon other tissues.

Fourth, the lessened number and quantity of the drugs which it is necessary for the patient to ingest, because of the increase produced in the efficiency and intensity of their action at the seat of infection; hence rendering it possible to avoid drug intoxication.

Fifth, in many cases which prove intractable to other measures its employment will render possible the extinction of the trouble.

Sixth, when properly and judiciously applied, its use is never productive of any vicious after-effect; on the contrary,

the patient's general condition is immediately and greatly improved.

Sprains are very frequently excessively troublesome to manage, and recovery from the injury is not infrequently a matter of from six to eight weeks. When one of these injuries is brought under the influence of hot air within four or five hours after it has been sustained, all traces of the trouble will ordinarily have disappeared in from two to four days. Instead of weeks of painful confinement we have days only, and as the pain is relieved immediately the patient does not suffer. These two results of its application entitled hot air to a place in the first rank of remedial measures for this condition, if not to the first place. These results appear magical at first sight, yet they have been obtained by the speaker and others time after time within the last four years. The treatment may be applied as often as the pain shows evidence of returning, no matter how frequently, without any bad effect on the patient. In this way he can be kept in a condition of constant comfort.

*Arthritis Deformans.*—This disease has been hitherto, under ordinary therapeutical measures, the despair of the medical profession. In hot air, however, we have an agent which alone will cure many of these cases, and which, in combination with static electricity and other rational therapeutical measures, will restore the majority of the victims of this disease to useful and comfortable lives. The pain is not so susceptible of immediate relief by hot-air treatment as it is in rheumatism and sprains, but electricity, in the form of the static, faradic, and the high-frequency currents, supplements hot air very satisfactorily in this field. To secure the best results we ought to combine hot air, electricity, and a few drugs.

The progress of the disease towards recovery is always slow, but usually steady when estimated in periods of weeks. From six months to a year is the time usually required to produce a cure, although I have seen cases cured in a month. I have also had them require two years. In a disease so intractable to treatment as this, it is a matter upon which we may most sincerely congratulate ourselves that we are at last in a position to promise the majority of our patients relief from their troubles; and this we may now safely do.

Pneumonia is another disease in which we frequently need

all the therapeutical assistance that we can secure, and hot air is one of the most potent of agents in the treatment of this disease. A local treatment applied over the affected lung will relieve the pleuritis and remove all signs of consolidation in from two to five days. The patient begins to improve immediately after the first treatment, and although the course of the disease is not shortened the severity of its symptoms is very greatly decreased. This rapid removal of the exudate does away with the danger of heart failure from overdistention, and the getting rid of the pleurisy does away with a large proportion of the respiratory oppression and cough, whereby the patient's comfort is greatly increased. The happy influence of the body treatment upon the eliminative function will do more to relieve the profound systemic toxæmia sometimes encountered than any other measure now known.

Local septic infection, proceeding from ordinary traumatism or surgical operation, responds most kindly to this agent. In the ordinary instances where the infection begins in a hand or foot, if the case comes under treatment before the infection has involved the lymphatics of the joint which connects the limb with the trunk, the local treatment will usually be entirely effective, and the patient will begin to improve after the first treatment. I have seen several severe cases of local infection, coming under treatment early, get well in three days. If the infection has gotten into the lymphatics of the trunk, however, the influence of the body treatment upon the organism at large will have to be invoked. I have up to the present time treated fifteen cases of local sepsis, of different degrees of severity, and every one of them has recovered. If any structure has become so profoundly involved in the destructive process as to render regeneration impossible, suppuration will ensue as a matter of course, and surgical interference will become a necessity. Hot air will not remove pus. It will, however, in at least a majority of cases, secure the recovery of the patient either with or without surgical interference, and in so far it is of inestimable value in this condition.

The symptoms of chronic and acute nephritis are usually very amenable to thermotherapy. The dropsy, oppression of breathing, mental somnolence, and cardiac disturbance will sometimes diminish during the first treatment and before the patient has left the apparatus. I have seen cases in which all

the albumin had entirely disappeared from the urine in three weeks, and so far as examination would show the patient had been restored to perfect health. How long this happy condition will continue it is of course at present impossible to say, but if the symptomatology does return the treatment can be applied again, and any nephritic would be glad if he could be maintained in apparent health by taking a course of hot-air treatments two or three times a year if necessary. The excretion of urea and the total output of urine are usually enormously augmented by the body treatment in this disease.

Lack of time prevents my discussing the other conditions in which hot air is useful, at any length, and I will merely mention those in which it has been demonstrated to be of value, as follows:

peritonitis,	plumbism,
pleuritis,	lithæmia,
synovitis,	varicose ulcers,
nervous debility and exhaustion,	neuralgias and myalgias,
chronic bronchitis and pulmonary	alcoholism,
tuberculosis,	muscular adhesions,
neuritis,	osteomyelitis,
tuberculosis of joints,	periostitis,
fibrous ankylosis,	myositis,
la grippe,	dysmenorrhea,
typhoid fever,	gangrene,
gouty diathesis,	eczema,
atheroma,	angina pectoris,
syphilis,	cholelithiasis.

I will say a word in reference to apparatus and technique. The local apparatus, to be effective, must be capable of producing a heat of at least 400° F. in twenty minutes, and of maintaining it steadily at that point as long as desired. The body apparatus should be capable of generating a heat of at least 350° F. in half an hour and of maintaining it at that point indefinitely. The heat should equalize itself in all situations and localities inside the apparatus, so that the thermometer reading and the temperature of the air which actually comes in contact with the patient should not differ more than five per cent. of the thermometer reading. The simpler the con-

struction of the machine the easier will be the attainment of this result.

The difference between proper and thorough technique and the reverse will very frequently mean the difference between success and failure in clinical results. Experience in the management of hot-air apparatus is very necessary. The current idea that it is a perfectly easy matter for any physician to secure a hot-air apparatus and treat his patient, without any special knowledge of the agent or of the technique involved in the management of it, is entirely erroneous and much to be deplored. It is to be hoped that this unfortunate error, existing in the average professional mind concerning hot-air therapeusis, will disappear in the near future, and when it does we may look for better results from the popular application of this agent.

In closing I wish to emphasize the fact that hot air is no panacea. It will, alone and unaided, cure some disease conditions; others will require all the therapeutical resources at our command; and in still others, even all that we can do will not suffice to produce a cure. Hot air is simply a rational therapeutical measure which, either alone or in combination with other remedial agents, will increase greatly our power to overcome pathological conditions, and which, because of the profundity of its influence in many situations, is entitled to an important position in our armamentarium.



## OZONE AND STATIC ELECTRICITY IN A CASE OF TUBERCOLOSIS OF RIGHT LUNG.

BY H. S. BOARDMAN, A. M., M. D., MONTPELIER, VT.

W. C. B., a railroad treasurer, aged forty, father died when a young man, but do not know from what disease. Mother lived to be seventy-five and died of cancer of the spleen. He has one sister, in good health.

The patient was slight, thin-chested with sloping shoulders; height five feet ten, and weight 140 pounds. In the spring of 1900 he had grippe, which left him with a hacking cough. He has had post-nasal catarrh for years.

In the summer of 1900 he took a cottage at Berlin Pond, six miles from town, and drove back and forth each day to his work. As the summer advanced his cough increased, catarrh grew worse, with loss of appetite and diminution of strength, and he lost sixteen pounds of flesh in six months. He had very little appetite for his breakfast, which he had been in the habit of vomiting; was much depressed in spirits, and his family became exceedingly anxious about him.

In October his family physician advised him to spend the winter at Southern Pines, N. C., but he did not see his way clear to do so. On October 30, 1900, he came to my office. I examined him carefully and found that on percussion there was a marked dullness over the third lobe of the right lung, with a good deal of tenderness over that region, and much less power of expansion than over the left. Inhalations caused coughing, and he expectorated a thick, heavy sputum of yellowish-green color. He told me that he had paroxysms of coughing in the morning, expectorating large quantities of mucus, and there was also more or less expectoration during the day. He had had night sweats during the latter part of the summer and fall. For some time he had taken cod-liver oil and creosote, without any apparent benefit. After examination he asked me if I thought electricity would do him any good, and said that he had been advised to come to me by Mr. P., his clerk. I told him that, if he would follow my directions, I was sure that I could help him. I then explained to him to some extent what the treatment would be, and he concluded to begin at once. His temperature was at that time 100° F., pulse 80, respiration 20.

Treatment.—My first treatment, as I have said, was October 30, 1900; consisting of ozone inhalations from one of Dr. Cyrus Edson's inhalers for ten minutes; the inhalation of ozone caused quite severe paroxysms of coughing, recurring at intervals for half an hour. This irritation was caused by the fumes of nitrous acid, which is mixed with the ozone. The ozone treatment was followed by an administration of static electricity—negative insulation fifteen minutes, which closed the first treatment.

November 1 he reported again and said that he had rested splendidly, could breathe more freely, had less catarrhal discharge from the nose, had lost his breakfast but once, and felt much better. His temperature was 100°, pulse 80, and respiration 20 as before. These treatments were all given between 7 and 9 P. M., which time would be likely to give an increase of temperature, pulse, and respiration, if any existed.

Second Treatment.—Ozone treatment of ten minutes, followed by Franklinic negative insulation, convective discharge, crown electrode, ten minutes, then disruptive discharge, brush electrode frictional application to the entire surface two minutes. This form of application to the skin is one of the most invigorating forms of static treatment. After the treatment he expressed himself as feeling the best he had for months.

November 3 he came for his third treatment and reported that his general condition was beginning to show improvement; he could breathe freely through the nose, had slept well, was coughing less, and had not thrown up his breakfast since the last treatment; had done his work with greater ease, felt lighter, and the tired feeling was decreasing. His appetite had begun to improve, in consequence of which he was stronger. He said: "I begin to think that I may be somebody yet."

November 5. Treatment same as before. With this treatment I introduced a variety of static electricity which I consider played an important part in the issue of this case, namely, the application of static electricity to the entire thorax, with a large sponge electrode well soaped, and connected to the positive pole by a brass chain; patient seated on platform with poles short-circuited, spark gauge from half an inch to two inches, as he could bear with comfort. The patient went over the chest and neck with sponge, then I placed a stool on

platform behind him and went over his back in the same way. This form of treatment took ten minutes and was wonderfully invigorating in character. It should have been mentioned before that the entire clothing was removed each time down to the hips.

November 8 he came for his fifth treatment, and reported a marked improvement in all of his symptoms; cough and catarrh much less, appetite good, slept well, and sweat very little nights, expectoration less, and had gained two pounds since he began treatment, and seemed in fine spirits.

The treatments were given three times per week until January 1. From January 1 to April 1, twice a week, and from April 1 to May 3, once a week, and were arranged as follows: One treatment consisted of ozone inhalation followed by static brush electrode frictional application to entire surface of body, then long, clean percussive sparks to body, localized to chest with fine needle sparks to throat. The following treatment would be ozone inhalation for ten minutes, followed by the static sponge electrode connected with a brass chain to positive pole, with poles short-circuited full ten minutes to the chest. These treatments were kept up in alternation three times a week until the temperature had dropped to 98.5°, pulse 72, and respiration 18 per minute; after which they were continued twice weekly for three months, and the next five weeks, once weekly.

There was a steady gain in appetite, strength, and an increase of eighteen pounds in weight, with a loss of but three days' time during six months' treatment. In all he took sixty-five treatments; has had no relapse and has enjoyed good health since, and now appears as well as ever.

He was examined by his family physician for additional life insurance in September, 1900, and rejected. In April, 1901, the same physician again examined him and found no trouble with the lungs, except a slight difference in the expansive power.

The result of this case convinces me that the future has great possibilities in the field of electro-therapeutics.

Electricity has come to stay, and will enter more and more into the treatment of diseases, and no amount of prejudice can stay its onward march.

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## THE USE OF ELECTRICITY IN CASES OF CONSTIPATION.

BY WALTER H. WHITE, M. D., BOSTON, MASS.

Constipation is an insufficient or delayed evacuation of the bowels produced by various causes. The bowels are usually spoken of as being in a normal state when the patient has a movement once in twenty-four hours, although for the hearty eater of middle life I think twice a day is preferable. Again, in many elderly people who partake of light meals every other day is frequently found to be their normal condition. Constipation arises from many causes, more especially diet, improper food, and lack of vegetables or liquids to render the evacuations of soft consistency; lack of physical exercise, patent medicines, abuse of cathartics and injections, causing impaired physical function, torpidity and paralysis of the intestines. It is not my purpose to speak here of constipation as a symptom of such diseases as cancer, diseases of the liver or pancreas, or as it is met with in diseases of the brain or spinal cord, nor in painful diseases of the rectum, which cause abstention from stool, but rather of those cases where the patient is apparently well and only complains of his bowels as being constipated. After taking the history of the patient and finding that a change of diet and the drinking of more water between meals has no especial effect, we stop the abuse of cathartics, and make an effort to stimulate the nerves and the secretions of the mucous membrane, thereby restoring action to the muscular coats of the intestines and increasing the action of the liver. For this purpose we employ proper electrical treatment.

If the liver is at fault we make use of a large pad, 75 to 100 cm., over the lumbar vertebrae for the cathode, the anodal pole being the common sponge electrode or a carbon roller electrode covered with chamois or cotton, to be moved over the liver from right to left, using the galvanic or continuous current of 10 to 20 ma., according as the strength of the current can be comfortably borne by the patient. This should be repeated daily, or at least three times a week.

In neurasthenia we cure the case by use of the static machine in general treatment and a strong static spray over the region

of the bowels, the manipulation being in the same general direction as the vermicular action of the intestines, viz., begin with the point electrode from the right side of the abdomen across the large intestine to the left side, and continue the spray on that side from five to ten minutes. This treatment should be in addition to the general static treatment as given to neurasthenics.

For patients of sedentary habit we use either the sinusoidal current or the coarse wire of the high tension coil, placing one pad over the lower lumbar vertebræ, and a small pad or a roller electrode labile over the smaller intestines and then over the ascending transverse and descending colon; the strength of the current should be sufficient to produce contractions without pain. For those patients who have been habitual users of cathartics I prefer the galvano-faradic current. We use a pad 150 to 200 cm. for the anode, to be placed upon the abdomen, the cathodal pole being one of the hydro-electrodes, this being placed in the rectum and connected with a syringe. Warm water, preferably a saline solution, should be employed with a current strength of 10 to 20 ma., as can be comfortable to the patient.

When atony of the muscular tissue is present, especially of the rectum, when there is a lack of expulsive force use a bipolar rectal electrode. The one devised by me and mentioned in the April number of this JOURNAL has many advantages, the current generated by the sinusoidal or coarse wire of the high tension coil for five to ten minutes being used.

In cases of constipation where stricture of the rectum is the cause, treat the stricture with the rectal olives, using the continuous current, as spoken of in a previous issue.

In fissure and hemorrhoids try the high-frequency current with Doumer's electrode. It has given excellent results in most cases.

220 Marlboro Street.

## A PLEA FOR THE BETTER APPLICATION OF ELECTRICITY IN THERAPEUTICS.

BY J. GRIFFITH DAVIS, M. D., NEW YORK.

In the long ago past electricity was used empirically, without regard to its fixed laws of action. As scientists have studied and demonstrated these laws, we have come to appreciate its power for good in the treatment of disease. We are aiming in this paper only to call attention to important points that, in the strenuous life of many physicians, may be neglected or lost sight of.

Electricity is defined as a form of force, a mode of motion, which is based on attraction and repulsion, chemical decomposition, or a phenomenon that includes all of these. Although it is said to have been discovered by Thales in the sixth century before Christ, we are still groping with many of its primitive conditions. As though to prove evolution, each generation produces minds that seem to be better able to cope with and understand its mysteries. It exists in all substances, is dependent upon an inherent force, and suggests the great law of vibration, as the potential is determined by the rate of vibrations passing from the positive to the negative, and vice versa.

In comparison with drug action, many times they are singularly alike, *i.e.*, in effects—with this distinctive difference: with electricity, we get special results on local points more speedily, whereas, with drugs, we frequently have to wait for constitutional changes. This is illustrated by a case I was called upon to treat. A man sixty to sixty-five years old, stone mason by trade, called with his left knee badly swollen and very much inflamed, a pronounced case of synovitis which was very painful. I thought it to be a case for electricity, on account of its mechanical, chemical, and physiological actions, and suggested that method of treatment. The patient promptly opposed it because, he said, he had had all the electricity he ever wanted.

It appears that at his doctor's suggestion he had tried electricity, employing it without reference to polarity, and it had been made worse. I still insisted that it was the treatment par excellence for his case, and he finally yielded.

I began with ten cells of my 40-cell galvanic battery, putting his foot on a plate attached to the negative pole in hot water saturated with sod. bicarb., and used a massage roller, wet with the same solution as hot as it could be borne, attached to the positive pole. My idea was to get the contracting action of the positive pole and thus force out the engorgement, compelling the morbid materials to move on. There is a certain amount of chemical action produced by hot alkaline fluids, a cataphoric action of the current, which aids in breaking up the toxic salts that interfere with the normal function. As the materials are rendered fluid the secretions move more rapidly, and the blood flows more rapidly to those parts. I was convinced that uric acid and its salts were playing the principal rôle, and took advantage of the fact that heat is a powerful factor in dealing with these salts. My theory was well proven by the results, for the exudate began promptly to disappear. After employing this method for ten minutes I reversed the current for five minutes, for the purpose of stimulating the circulation.

The swelling not only disappeared like magic, but the pain was promptly relieved. The electricity was rubefacient, producing at the seat of severest pain the appearance of having had a mustard paste applied. An ointment of oxide of zinc was ordered as an emollient over the half-raw spots, to be applied on linen, and the knee was then swathed in flannel, kept warm. These séances were repeated every alternate day for two weeks. The number of cells were increased to thirty-two as the extreme sensitiveness abated, and the time of application reduced to five minutes over different points. The limb was restored to its normal condition.

I met him years afterwards and learned that he had never had any trouble with the limb since the treatment. I have cited this case to emphasize the title; *i. e.*, to determine the best mode of application indicated in each given case. In the above case, drugs had proved utterly unavailable. The condition was so chronic, and the vitality of the parts so much lowered, that there was no normal action. It was aimed to restore tone to the muscular coats of the vessels and thereby squeeze out the offending, sluggish contents, thereby demonstrating the triple action of the current, chemical, mechanical, and physiological. The swelling was reduced by the action of the

current on the glands and vessels, causing them to throw out the débris that had accumulated from the stagnation in and around the parts. The use of the hot alkaline solution must not be lost sight of in this connection, as an aid in eliminating the products of faulty metabolism. We often get the best results and more rapid effects by the judicious combination of electricity and drugs. The necessity of studying our cases as to the condition of all the organs of the body, to learn where the lost rhythm has occurred, in order, to intelligently apply our remedies is apparent. A perfect balance is essential to the proper functioning of the organs of the body. When we succeed in restoring lost equilibrium, nature will do the work.

The best strategy is shown in settling preliminaries before treatment is instituted. Weigh each case well to determine the indications and methods of treatment. A few years ago a patient who had had a long, severe illness, and was much reduced and emaciated, came under my care. A large bed-sore was developing in the region of the sciatic notch, over the glutei muscles of the right side. The parts were swollen and inflamed over an area four to six inches in diameter. A consultant in the case, in looking the patient over, remarked; "You are going to have an ugly bed-sore there, doctor."

I replied, "I think not, as I shall use electricity and abort it." The doctor gave an incredulous shrug of the shoulders and said, "You will soon find out your mistake." As the case had begun to manifest itself by swelling, redness, etc., no time was lost in attending to it. The faradic current from a Kidder high-tension coil was used, employing the positive pole on the swelling, and the negative at the base of the spine. The same effects were sought as in the first case reported, *i. e.*, the mechanical effects, to hasten the removal of the exudate from engorged vessels before decomposition set in. Uric acid and its salts were suspected to be factors at work, and moist heat was again employed. The rapidity of the disappearance of the whole manifestation verified these conclusions. The parts were also painted with iodine and belladonna four parts of the former and one part of the latter, for the alternative and sedative actions. This would also meet a strumous condition; the relaxing element in the belladonna was also an aid to assist nature in throwing off effete material through the ordinary channels of the body.

Before my consultant called again I had the satisfaction of seeing the swollen, inflamed tissues restored to a normal condition.

When the doctor, who to this time had taken no stock in electricity, came, expecting to see a fully developed bed-sore, the power of electricity was displayed. Since that time that same physician has spent hundreds of dollars in fine apparatus and uses it extensively. The same patient was given electricity as a hypnotic every night, as all medicines had failed. For this purpose slippers with copper insoles, attached to a bifurcated cord and attached to the positive pole were employed, and the two handles attached by same kind of device also to positive pole. A long flat electrode was applied to the spine and that attached to the negative pole—the primary current was used, as it proved to be the most sedative. This was given every night for twenty minutes, and she would go so profoundly to sleep that I could remove the electrodes and stop the current without disturbing her. My purpose in writing this now is to jog the memory of those who know it, but in the pursuit of new methods let go some of the old, tried, and true ones. I have had many patients who invariably fall asleep under the influence of the milder currents. Some of the effect may be attributed to the rhythm of the vibrations. Either galvanic or faradic currents equalize the circulation, increase the flow of blood to the surface and extremities, and improve nutrition and assimilation. Hence, in a general practice, one can soon learn what a host in themselves good batteries are.

Who shall apply electricity? Only especially trained, educated physicians should handle such a power for good or ill. Another case was treated in the city of New Orleans. When summoned it was supposed to be a case peculiar to women, but upon examination three hemorrhoidal masses were found protruding from the rectum. She was suffering intensely, and one of the hemorrhoids was so congested that it seemed to be on the verge of gangrene. The masses seemed to spring from a common pedicle, and were in close proximity. When I had thoroughly examined the conditions an immediate surgical operation seemed to be indicated. There was such great vascularity that galvanic cautery suggested itself as the proper procedure. I called in consultation a physician who had a

cautery battery; the parts were coccainized, and a snare was placed about the base of the mass and drawn up snugly, and the hemorrhoids were wholly removed without hemorrhage, and no resulting cicatricial tissue. The patient made an uninterrupted and uneventful recovery. In three days she was able to be about her rooms, and out of doors within a week.

It is an undoubted fact that measures which succeed in the hands of one physician in the hands of another will be a dismal failure. This is especially true with the various electrical applications. Some succeed better with one form of administration and others with another. It is best to know them all well and be ready to adapt them to suitable cases. Do not be prejudiced or conceited, but flexible and open to conviction.

All medical colleges should add electro-therapeutics to their curriculum and teach it as thoroughly as any other subject. Those physicians who have not had such opportunities should take post-graduate courses, and qualify themselves thoroughly before undertaking the use of an agent so capable of doing mischief. Only in this way can it be taken entirely out of the hands of the quacks and elevated to the position it deserves in the cure of disease.

I will report two cases that show the distinction between surgery and electricity in these cases. Mrs. J. B. had been a long sufferer from hemorrhoids; she had been treated by ointments, etc. A surgical operation was advised. Another patient, M. G., who suffered in a similar manner, was also advised to go to the hospital. They were skillfully operated upon. In the former case four masses were removed with the knife; in the latter case seven. In one case two fissures were found, anterior and posterior, and the ulcerated tissue was all removed. Both cases made very slow and incomplete recoveries. The resulting cicatricial tissue made their condition almost as bad as they were before the operation for strictures had been performed. The caliber of the rectum was greatly lessened by these bands of organized plastic lymph. Forced dilatation under an anæsthetic was contemplated, but after consultation with the late Dr. F. D. Payne of Bayonne, N. J., it was abandoned. He suggested electrolysis, and gave me a letter of introduction to Dr. Robert Newman of New York—one of our honored Fellows—stating that he himself had witnessed cicatricial tissue re-

moved by Dr. Newman in similar cases. Dr. Newman at once began the treatment of the two cases. Marked and prompt relief was afforded with very mild currents. No radical measures were necessary, and neither patient was disabled at any time. I have said nothing of static electricity because I have not used it myself. I have, however, witnessed much of its good work in cases referred to Dr. Robert Newman and Dr. S. Phelps of New York City. I propose to take my own advice and take a post-graduate course in static methods at my earliest opportunity and would urge my fellow associates who have not already done so to do likewise.

114 West Thirteenth Street.

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## ETHER.

BY GEORGE ADAM, M. D.

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(Concluded.)

*Trophic Nerves and Gland-Molecules.*—The nerves which supply the glandular structure are efferent. Being such, in what way do they differ from motor nerves? There is no reason to suppose that in structure and in the character of the impulse conveyed they differ from other efferent nerves. Moreover, the secreting elements of a gland and the contracting elements of a muscle may be histogenetically identical. Again, if all efferent nerves convey the same impulses, the summations of these impulses in the muscles and in the glands may have a common principle. There is reason to believe that all efferent nerves produce their differential effects through the common principle of polarization of the histologic or molecular elements of the structure acted upon.

Microscopic work conducted recently indicates that the secretory nerve fibers terminate in a plexus between and around the epithelial cells, from which it may be inferred that the gland-cells are acted upon directly by nerve impulses. These nerve impulses must polarize the gland-cells, and during polarization certain positive and negative elements are eliminated from the cell-body or histologic molecule. The character of

these elementary ions may be judged from the character of the cell structural elements. These elements may be considered as + HCPNSO—the most negative element, oxygen, will appear at the negative pole of the cell-body; and the most positive elements, hydrogen and carbon, at the positive pole. In fact, the cell will act exactly as if it were part of the exciting nerve, and the polarization of the nerve tissue and of the gland-cell tissue will in no way differ, only in the larger chemic and physical effects produced on the part of the latter. Neither will polarization of the gland-cells differ from polarization of the muscle-cells, only in those differential results arising from the fact of the muscle-cells undergoing distortion and compression previous to polarization, and in the sequential physiologic and chemic facts depending upon different environment.

The result, then, of nerve action on the gland-cells is dissociation of certain positive and negative atoms from the structure of the cell-body. The ions eliminated are in the nascent state, and will take one of the following courses:

1. They may combine and form simple compounds.
2. They may react on salts that may be present.
3. By anabolism they may be incorporated into carbohydrates or proteid bodies or molecules.

The course will be influenced by the character of the proximate material and by the degree of pressure to be overcome in the metabolic change. If the gland-cell is bathed in a solution of sodium chlorid the following reactions will take place:  $(NaCl)_2 + 2O + C + 2H = Na_2CO_2 + (HCl)_2$ . The above formulæ will explain the presence of hydrochloric acid in the stomach during digestion.

If the same gland-cell be placed in the liver and surrounded by glycogen, the reaction will be as follows:  $C_6H_{10}O_5 + 2O + C + 2H = C_6H_{12}O_6 + CO_2$ . The  $CO_2$  is held loosely in combination with the secretion of the liver and the glucose is taken up by the blood. If the gland-cell is surrounded by proteids, under the proper degree of pressure, the ions, carbon, hydrogen, and oxygen, are forced into the molecule of the proteid, and the glyco-proteid mucin is formed. The formed material of shells, nails, and bones are produced by  $CO_2$  being ionized by nerve action, and the ions uniting with the calcium of the blood.

It is clear that anabolism taking place in a gland will be modified by the intensity of nerve action,—number of ions,—by

the character of the substance derived from the blood which is acted upon by the ions, and by the degree of pressure within the gland. The factors modifying pressure are number of ions, arterial tension, and rigidity of the connective tissue of the gland.

If a nucleo-proteid is placed within the gland, and the pressure regulated by the structure of the gland, and the temperature by nerve action, clearly the ions will be forced into the molecular construction of the nucleo-proteid. Thus ptyalin, pepsin, trypsin, and other enzymes may be produced by a slight differentiated action resulting from a modification of one or more of the above factors. Obviously, the nervous system has two distinct functions in connection with glandular action. It regulates the amount of blood reaching the gland by means of the sympathetic, and modifies the elements of the blood passing through the gland by means of the cerebral nerve, the modification being produced by ions the result of nerve action, which are incorporated into the molecular construction of the blood-elements present in the gland, thus raising their potential.

The Spermatozoon and the Ovum.—Flint refers to a memoir by Lott, containing observations on the behavior of spermatozoa in the presence of electric currents and under the microscope. It was shown by the experiments of Lott that in the part of the field where the current was strong the moving spermatozoa were carried along with it—toward the cathode; but when the current was comparatively feeble the spermatozoa made their way against it—toward the anode. In treating of the galvanic current passing through fluid, we find that oxygen in the molecule of water becomes electrified by the positive current, and is attracted towards the negative pole to the point of neutralization, and then by induction it immediately seeks the positive pole. Now, a critical examination will show that the fundamental principle governing Lott's experimental facts and those governing oxygen in the fluid are identical. Oxygen when charged positively will seek the negative pole, but when not charged it will seek the positive pole by induction. In Lott's experiments the spermatozooids when under a strong current are electrically charged, and by virtue of the charge are carried towards the negative pole; but when very small currents are used, other material more minute and more easily

moved is charged, and the spermatozoid, being of negative electric potential at the neck or head, as oxygen is electro-negative, moves by induction toward the positive pole. The ovum is carried along mechanically by the ciliary movement, which is directed by the charge on the free end, which is of positive electric character. The spermatozoa do not touch the cilia, but by induction seek the positive pole of the ciliary current, which is at the ovarian end of the fallopian tube. They are directed entirely by the negative potential of the head or neck, which, like oxygen and other negatives, seeks the positive pole. The motive power of these bodies resides in the axial fiber, which is composed of molecules of negative potential (sixty-five per cent. negativity), which is stimulated by the positivity of an alkaline fluid; and this physiologic fact represents the principle of initiatory stimulus to respiratory and circulatory movements, *i. e.*, the positivity of the blood serum in contact with the negative neural molecule or histologic in the terminals of the afferent fibers of the pneumogastric.

The spermatozoa and the ovum usually meet in the fallopian tube near the ovarian end. The spermatozoa approach the ovum and surround it in large numbers. They lash their tails and several may succeed in reaching the perivitelline space, but only one penetrates the substance of the ovum. The success of one causes the collapse of the other. The head of the successful one, now called the sperm-nucleus, separates from the tail and makes its way toward the center of the ovum. The egg-nucleus also moves toward the center, where the two meet and form the first segmentation-nucleus. The middle piece accompanies the head to the interior of the egg.

What is the character of the attraction that exists between the spermatozoon and the ovum? Admittedly, physiologists have not found a satisfactory answer.

We believe that crystallization, coagulation, contractility, gland-cell action, electric-cell, and conductivity depend upon molecular polarization, and it is probable that this fundamental property of all matter is an important factor in the relationship of the ovum and the spermatozoon.

It must be distinctly borne in mind that neither the nucleolus of the ovum nor the centrosome of the sperm has been called into functional activity previous to their union. The part played by them has been entirely negative. They have been

built up from the potential of environing structures, but separately neither is capable of performing its special function. That function fundamentally is simply to alternately polarize and depolarize, and its specialization resides in environing conditions.

It is seen that certain salts cannot crystallize without the water of crystallization, that coagulation cannot take place without the presence of calcium, and that muscular contraction—polarization of the anisotropic substance—is only effected in the presence of the isotropic substance. Furthermore, it is probable that the common basis of these and other phenomena is polarization, and the essential additional molecular substance we have called associated molecules of polarization.

In short, the theory is here advanced that the relationship of the sperm-centrosome to the germ-nucleolus is identical with the relationship of the associated molecules of polarization to the polarizing body, or identical with the water of crystallization to the crystallizing substance. A study of the anatomical differentiation of the ovary and testicle leads us to believe that the nucleolus of the ovum, towards the end of its anabolic period, is nourished by carbon dioxid,  $\text{CO}_2$ , or hydrogen carbonate,  $\text{H}_2\text{CO}_3$ ; whilst the nucleolus of the spermatozoon—sperm-centrosome—is nourished during the same period by calcium carbonate,  $\text{CaCO}_3$ . Beginning with a common basic cell, nature therefore differentiates the sperm and the germ by means of these chemical substances.

The ovarian nerves have been traced to the covering of the Graafian follicles. There being no physiologic reason for cerebro-spinal fibers terminating in the follicular theca, it is reasonable to conclude that fine twigs penetrate the envelope of the follicles and terminate in contact with the cells of the membrana granulosa. By so doing they correspond in their mode of termination with the nerve filaments in other glands and in the muscles. The results of nerve action on the epithelial cells of the membrana granulosa are the production of ions, as in muscular or gland polarization. These ions are probably hydrogen, carbon, and oxygen, and they have a tendency to form simple combinations, but this is rendered impossible by the resisting pressure of the fibrous tissue of the ovary. The ovum, situated in the midst of an aggregation of cells of the discus proligerus, which are practically nerve terminals, and

being the only cell not connected directly or indirectly with nerve filaments, becomes enveloped in an intense potential, and as the ions continue to develop by nerve action they are forced into the molecular construction of the ovum. In the early history of the Graafian follicle, before the complete development of the basement membrane, osmotic communication with the blood remains intact, but it is quite possible that toward the end of its history that the Graafian follicle, or rather the membrana granulosa, presents the anomaly of a part of the body being nourished through the nervous system—in the same manner as a neurone is nourished from its cell; that is to say, by chemic displacement, or on the principle of equipotential surfaces, as manifested physically in fluids, and electrically on charged conductors. A blood supply is essential to laying the base of a cell, but afterward its negative potential may be maintained or raised by nerve action or nerve connection.

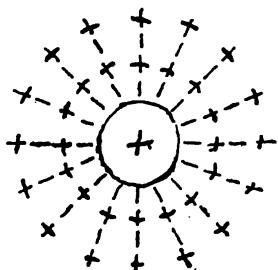
Each semeniferous tube is connected with the basement membrane, which is divided into two layers: (1) A delicate homogeneous layer on which rest the epithelial cells; and (2) a layer of endothelial cells, which bound the lymphatic spaces. From the epithelial cells the spermatozoa are developed. The nerves of the testes are distributed to the surfaces of the semeniferous tubes. They have not been traced to the epithelial lining of the tubes.

The layer of the endothelial cells in the testes is the analogue of the membrana granulosa in the Graafian follicle, and the cells of both are the real terminals of cerebro-spinal nerves. The placements of the membranae propriae are the important factors in the differentiation of ova and spermatozoa. In the ovary the membra propria of the follicles, which is comparatively dense, is placed between the terminal nerve cells—membrana granulosa—and the circulation; in the testis the membrana propria, which is delicate, is placed between the terminal nerve cells—the endothelial layer—and the epithelial cells, from which are derived the spermatozoa. The endothelial layer of cells border on the lymph spaces.

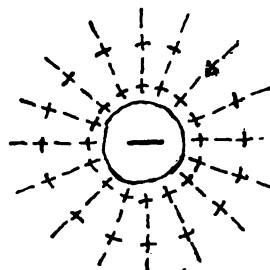
Now, after the formation of the basic membrane, if any part of the blood reaches the interior of the Graafian follicle it must consist of the more diffusible elements; but, as we have already suggested, it is probable that it is only through the nerve fila-

ments that such elements are conveyed to the follicle, and it is probable that osmosis is outward and not inward.

In the testicle the hydrogen, carbon, and oxygen ions, produced by nerve action through the endothelial cells, have the opportunity of acting on the lymph which bathes the surfaces of the cells. The most probable result of this action is the



Positive electrified body with induced field; electro-positive molecule of ponderable matter with its free or vibratory space; an enzyme; a molecule of strychnia; an organic nutritive molecule such as nuclein; the sperm centrosome.



Negatively electrified body with induced field; electro-negative molecule of ponderable matter with its free or vibratory space; a nucleolus with its induced magnetic field—the nucleus; the anisotropic substance with its induced field—the isotropic substance; a molecule of chloroform; the germ-nucleolus.

As represented on the inner spheres of the figures the electric potentials consist of ether-units placed on insulated bodies; the potentials of molecules consist of unneutralized ether-units in the molecular construction. The plus and minus signs of the outer spheres, or induced magnetic fields, show polarization of ether molecules, or polarization of ponderable molecules. The polarization can be demonstrated in the induced fields of electric potentials.

formation of a calcium carbonate,  $\text{CaCo}_3$ , or  $\text{CAH}_3(\text{CO}_3)_2$ . This salt, together with surplus ions not reacted upon by the blood-elements, evidently reaches the epithelial cells by exosmosis through the delicate membrana propria, the pressure being in this direction. The conception is easy that these elements, and other elements of the blood, will build up the differentiated structure of the spermatozoon under the proper temperature and pressure, the osmotic diffusibility of the elements being an important factor in the differentiation. Thus the calcium salt from its positive concentrativeness and atomic weight will form the base of the end-knob—the centrosome; the more negative elements will give character to the axis-cylinder of the tail. The position of the spermatozoon supports this explanation, the head being the part approximating the membrana propria.

The important physiologic difference between ova and spermatozoa is the electro-negativity of the nucleoli of ova, and the electro-positivity of the nucleoli of spermatozoa; and the difference probably rests on the electro-chemic qualities of calcium carbonate representing the sperm-centrosome, and hydrogen carbonate representing the germ-nucleolus, these elements forming the nutrition of the respective cells during the end of their constructive period.

Observations prove that the germ-nucleus advances to the center of the ovum to meet the sperm nucleus, and that only one spermatozoon penetrates the ovum. This proves that a distinct spherical equilibrium has been established between one spermatozoon and the ovum, and that attraction has ceased.

For the first time in the history of the germ-nucleolus it rounds out into a true spherical form, with equipotential hemispheres—molecular polarization. Under the stimulus of the new conditions it immediately proceeds to divide.

The phenomena of cell-division together with all the changes within the nucleus and cytoplasm—karyokinesis—can be explained in detail on the hypothesis that they proceed from the initiatory division of the nucleolus, *i. e.*, that the potential energy that accomplishes the phenomena of division is resident in the histologic molecule of high potential, or nucleolus.

We have stated that on the bases of the hypotheses, as formulated in the beginning of this article, that all electric phenomena can be explained; that all physical and chemical facts, that we have considered, are explicable on the same bases. Can as much be said for physiological facts? Here a reservation will be made. In the first place, it is difficult to know what are the facts of physiology; in the second place, human reasoning is as fallible as the observations of experimenters. However, we will say this, that we have considered the main physiological problems, and without exception they are perfectly clear under the light of the theory advanced; even the phases of a vibration being explainable. Experimental investigators have been bombarding a fort for a hundred years, and it seems impregnable to their attacks. Shall the gates be thrown open to them by the somewhat neglected study of electric science?

## **Editorial.**

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### **PHYSICAL METHODS WILL REPLACE MANY SURGICAL PROCEDURES IN THE FUTURE.**

THAT this is pre-eminently the surgical era in medical history there can be no doubt. The introduction of antiseptics, now nearly twenty years since, and the later adoption of aseptic methods, made possible the performance of heroic operative procedures which have resulted in such triumphs and successes as mark an advance unprecedented, we believe, in any science.

With these possibilities of the art, many daring and radical operations have been performed, which have already induced a positive reaction and a growing tendency to conservatism, which is certain to lessen the number of such procedures in the future.

The field of application for the physical methods is not at all confined to the treatment of so-called chronic diseases generally rated as incurable. Acute inflammatory conditions are more successfully relieved by the scientific applications of heat, cold, and electricity than by other methods too often recommended. Rest-splints and braces should only be employed in joint affections where fracture or a tubercular condition is present. All sprains and other acute and chronic inflammatory conditions, in which the presence of pus and malignant disease can be excluded, are successfully treated either by heat or static electricity, or both. Why a recent sprain, that can be permanently cured by such methods within a week, should be allowed to suffer on for months under treatment by rest and strapping, possibly with the addition of liniments and actual cautery, is only to be explained by the fact that those who employ them either lack the facilities or familiarity with the better methods, or both.

Prostatic enlargements are as a rule associated with some degree of inflammatory action, which may have persisted long after a gonorrhea, which may have induced it, has disappeared. Hypertrophy of the prostate is usually caused by an inflammatory process, which may arise from various causes. At least seventy-five per cent. of these can be relieved, and most

of them permanently, by the use of static electricity. A metal electrode (the wave current) applied from the rectal side, employing a spark-gap three to five inches in length, continued for twenty minutes is a safe and effective measure, that can only be appreciated by its employment. It is a method certain of universal adoption when prejudice is so far removed that surgeons adopt the rational methods with the same eagerness with which they adopt a new operation. But a small percentage of the profession now realize the value of electricity or understand the methods of employing it scientifically. The history of the treatment of stricture of the urethra by Newman's method, which is far the safest, most successful, and satisfactory practice when the physician once understands the technique, will repeat itself in the treatment of prostatitis, except that an element of danger present in the former when a novice employs it without the milliamperc meter is absent in the latter.

Time only is necessary to establish electricity and physical exercise in their proper sphere in the treatment of female diseases. Emmet should ever be remembered for having placed the employment of heat in the form of the hot douche prominently before the profession. At some future day, when the physician becomes as familiar with the employment of electricity as he is to-day with the use of the hot douche, very much of pelvic surgery will be abandoned, and the sufferings of the female be greatly diminished. Forceful dilatation for dysmenorrhea will cease to be practiced when the effects to be derived from negative electrolysis and the high-potential currents are appreciated. The Alexander operation, with its baneful effects when the patient again becomes pregnant, will be done no more when it is fully realized that the same current which relieves the congestion of the enlarged prostate will have the same effect upon the congested or subinvolved uterus and at the same time restore tone to the round ligaments. Others will be restored by internal galvanization and faradization as advised by Massey and Apostoli, and the barbarous and often useless practice of curetttement will be less often employed. The hyperæmic kidney of Bright's disease can be successfully and scientifically relieved by the high-potential electric currents, as shown by Rockwell, or by dry hot air, demonstrated by others, and in the future these methods are

certain to be employed years after the unscientific and irrational practice of removing the capsule of the kidney is abandoned.

The day for removal by the knife of superficial epitheliomas seems already doomed. It is meddlesome surgery to employ a measure which history shows to have been almost invariably followed by recurrence, when it has been repeatedly shown that the X-ray will effect the removal with a prospect that it will not recur.

Surgical measures, we repeat, will be adopted when better and more rational methods fail to be recognized. This is the surgical era, and surgery has accomplished wonders. Conservatism, however, is dawning. A better education in rational methods will at some future day greatly curtail the use of the knife and the present abuse of a congested pharmacopoeia.

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#### **THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.**

WE would call attention to the announcement and programme for the American Electro-Therapeutic Association, which meets at the Hotel Kaaterskill on September 2, 3 and 4, 1902. The papers, which are already announced, are an assurance that the meeting will be one of great scientific value. Several papers are promised on the X-ray in the treatment of cancer. Members of county societies or of the American Medical Association in good standing are eligible for membership. The membership fee, which includes the first year's dues, is \$5.00. The editor will forward blanks for application to any who may care to become members of the association.

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#### **DEPARTMENT OF HYDROTHERAPY.**

We announce with satisfaction that the department of hydrotherapy after this month will be conducted by Dr. Curran Pope of Louisville, Ky.

## **Progress in Physical Therapeutics.**

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### **DISEASES OF THE ALIMENTARY CANAL.**

EDITED BY WALTER H. WHITE, M. D.

*Dilatation of the Stomach. Methods of Curing it.* To the Editor of the International Medical Magazine, June, 1902.

As a subscriber to the International Medical Magazine, I take the liberty of asking you to favor me, by answering briefly and frankly the following questions:

In dilatation of the stomach due to atony or chronic gastritis, of what benefit is electricity (in any form)? Can the stomach be reduced, either partially or wholly, to its normal size by the use of electricity?

It seems hard to understand how the muscle fibers of the stomach, once abnormally stretched, can be reduced to their normal condition by intragastric electricity or any other method of treatment. If you have seen such cases cured, please inform me, also how lasting the cures were.

By enlightening me on these questions you will greatly oblige,

*Reply of the Editor:* In medical matters our duty is first to observe phenomena and afterward to account for them if we can, as well as we can. The fact is that intragastric faradic electricity, and sometimes extragastric faradism in strong doses, does, as a matter of observation, contract atonically dilated stomachs, that is, when there is no obstruction in the pylorus. I have seen certainly dozens of such cases, under my own care here, in which, by the conjoint action of abdominal massage, deeply and thoroughly done every day, and intragastric electricity applied in the way which I have explained in several papers, the stomachs have been reduced to their normal limits. Some of these at the beginning of treatment extended several inches below the level of the umbilicus. So much for observed facts.

Now as to the explanation of them. I do not see anything impossible, or even remarkable, in the fact that the most powerful agent we have for the stimulation and contraction of muscle fiber, namely, electricity, should do in the stomach what it is constantly doing with the external muscles of the body. Flabby muscles about the arms, legs, and back are constantly strengthened and enlarged by both massage and electricity. This is accomplished by increasing the flow of blood to the parts by the direct stimulation, thus contracting them and strengthening them. Of course when a case of

atonic dilatation of the stomach has progressed to an extreme degree, and has gone on for many years until past middle age, when there is reason to suspect that the muscular fibers have undergone some degenerative changes, it is not impossible that such treatment might fail. But the less chronic cases in younger persons are constantly responding to the treatment as above described, and several of the patients have been more than fifty years of age.

It should be added that in the case of gastric dilatation associated with chronic gastric catarrh, it would be necessary also to treat the catarrhal inflammation by the usual measures, including diet and lavage, with or without the intragastric atomization, with appropriate astringents. Such patients, too, have always been instructed to employ daily a few gymnastic movements designed to increase the tone of the abdominal muscles.

As to the permanency of the results obtained in gastric dilatation by the methods mentioned, I can only add that those who have remained under observation or returned subsequently for examination, have uniformly retained the improvement gained, when they continued the physical exercises and confined themselves to a reasonably careful diet.—ED.]

We can refer to article in July number by Dr. F. H. Morse, on electrical treatment of stomach dilatation of two cases, one having received treatment nearly two years ago, as answer to our contemporary.

W. H. W.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D.

In the International Medical Magazine, New York, for May, are four articles on the Urine, viz.:

1. The Study of Urine in young children. J. Madison Taylor.
- . 2. Urinalysis in Children. Floyd M. Crandall.
3. Urinalysis in Gyneco-Surgery. William Krusen.
4. The Study of the Urine in Genito-Urinary Diseases. H. M. Christian.

It is always interesting to study articles on the same subject by different observers, by which the intelligent reader must benefit.

The literature on the troubles of the prostate is very prolific, and we note many more articles.

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*Removal of Prostatic Adenomata.* William Thomson.

Thomson refers to Freyer's work on the subject and especially mentions the difference of opinion in regard to the cap-

sules of the prostate, pointing out that there are three things which are mentioned under this name: 1. The proper capsule indicated by Freyer, which is a special envelope, belonging to the prostate itself, and, although thin, is firm in texture, and defines clearly the form and limits of the prostate. 2. A layer of thinned prostate which remains in certain cases when a large adenoma is enucleated. 3. This is formed by the normal reflection of recto-vesical fascia. The question as to whether the whole prostate can be removed is also mentioned, and he finds the testimony a little perplexing. However, it is not of much particular interest beyond emphasizing the importance of accuracy in the use of the term in the description of the operative procedures. It is not of much matter to the patient whether a complete prostatectomy or removal of the adenoma is performed if the mechanical obstruction is relieved.

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Intrapubic Section for Prostatotomy and Prostatectomy is the title of a paper read by E. Wyllis Andrews of Chicago at the Surgical Section of the American Medical Association held in Saratoga, N. Y., on June 13. In order to remove the obstruction to the flow of the urine he proposes to cut away the support to the gland below, after which a free flow of urine through the urethra would follow. For a radical operation he is in favor of the suprapubic route.

Suprarenal Extract in Diseases of the Genito-Urinary Tract (New York Medical Record, June 28) was a paper read at the New York County Medical Association, May 19, 1902, by Dr. E. L. Keyes, Jr. He uses the extract principally to avoid hemorrhage in meatotomy. After an aseptic injection of the urethra he inserts half a grain of cocaine, to be followed by one grain of the suprarenal extract as a powder. After the cutting he applied glutol, which is a combination of formaldehyde and gelatine to prevent any possible hemorrhage. Sometimes he uses the suprarenal extract in examinations with the cystoscope.

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*Gastrophtosis the Cause of Symptoms Erroneously Attributed to Nephroptosis.* N. Y. Medical Journal, June 21.

Achilles Rose, who states that the authors who have made much of the floating kidney as a pathologic condition producing symptoms, maintains that it is found much more commonly because our diagnostic methods are more complete and that the symptoms produced credited to the kidney are often those due to displacement and disturbances of other viscera. He says the following conclusion is easily drawn: Enteroptosis marks certain symptoms which are relieved when enteroptosis is relieved, and nephroptosis is included in enteroptosis, and

it is impossible to see how the displaced kidney can be accused of causing the symptoms attributed to it exclusively.

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*Permanent Results, Failures, and Relapses following Bottini's Operation for the Relief of Prostatic Obstruction.* E. Kreissl, *Ibid.*

Kreissl reports a number of cases in which the Bottini operation was performed, in some of which the symptoms recurred. He remarks that the effects of the cautery will be different when applied to solitary lobes or collar-shaped protrusions, and they will be more pronounced in the former than in the latter case, and more lasting and conspicuous in the smaller protrusions than in the larger ones. The results will be satisfactory, as a rule, in case of diffuse, real hypertrophy in which stroma and glandular tissue are equally affected. They will be less gratifying in the general and circumscribed form of fibromyomatous hypertrophy and in all cases in which protrusions obstruct the prostatic urethra. He does not consider an incision penetrating the entire lobe as essential for success, and gives his reasons for the same. He says if the case is suited for the Bottini operation at all, the incisions in the longitudinal axis of the elongated portion of the posterior urethra are the only ones necessary and effective, and that it is sufficient to burn the groove deep enough to establish a lumen of the approximate caliber of the normal urethra. He also criticises the recommendations of Freudenberg to some extent, objecting to the size of knife he advises for thick lobes, and holding that the location of the beak in the bladder cannot be superintended by his method during the operation. A close observation of cases of the Bottini operation would permit the conclusion that the so-called galvanocautic radical treatment is but a palliative operation, which nevertheless is the operation of choice on an enlarged prostate of a small or medium size in patients whose physical condition does not permit prostatectomy or whose advanced age would preclude the probability of recurrence or obstruction. Prostatectomy is the operation to be given preference when practicable, and new methods have gradually simplified it and reduced the mortality.

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### LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.,

*The Electro-Magnet for the Removal of Foreign Bodies from the Air Passages.*

The electro-magnet for the removal of particles of iron or steel from the eye is now so extensively used that some form

of the "giant-magnet," even for this purpose, is now found in almost every hospital where the eye receives special attention.

More recently, the electro-magnet has also been used for the extraction of magnetizable foreign bodies from the air passages. Voltolini in 1875 first suggested its possibilities in this direction, but its utility was first practiced in the extraction of the laryngeal tube used in diphtheria, this being done by Dr. John Bartlett of Chicago (Scheppegrell, "Electricity in Diseases of the Nose, Throat, and Ear," published by Putnam's Sons). The body of the instrument was an ordinary electro-magnet, such as is used for the removal of pieces of iron from the eye, a long curved polar extension-piece projecting from the body of the magnet, and of sufficient length to reach the tube in the larynx. The laryngeal tubes were made of brass, but the heads were of iron, so that they could be extracted by the electro-magnet. As the capacity of this extractor was limited to a lifting power of only one-half pound, it was soon abandoned by its inventor.

An electro-magnet tube-extractor has been constructed by W. W. Wetherla of Chicago (American Journal of Obstetrics, Vol. XXXII., No. 3, 1895), which embraces the principle of the horseshoe magnet, which possesses decided superiority over other forms of magnets. In this extractor, instead of the electro-magnet being in the hand-piece, it is at the working end of the extractor, so that the tube, which is to be lifted, comes in direct contact with the working end of the core of the magnet. The great mass of iron, which is magnetized by the electric current, is at the far end, to which the handle is attached. It is ten centimeters long, and has the same curve as the O'Dwyer pattern, and is made entirely of soft pure iron instead of brass or German silver, as those in ordinary use. They are heavily nickel-plated, which has been found to be as serviceable as gold-plating. These tubes may be retained in the larynx a number of days without rusting.

Instead of tubes being made entirely of iron, they may also be made of brass with iron heads, as it is this part of the tube through which the magnetic lines will pass. When this extractor is excited by a direct current of six volts, and applied to the head of the smallest-sized iron tube, the lifting power is two pounds; and when applied to the larger-sized children's tube, five pounds. This force is in excess of the strength that will be needed for the removal of the tubes from the larynx.

In the first instrument, which Wetherla constructed of this pattern, the interrupter was attached to the handle, but he found this inconvenient, as the operator, in the excitement of the extraction, is liable to move the interrupter and cut off the current, thereby allowing the tube to lose its hold from the extractor and fall back into the esophagus of the patient, an accident which has once happened in his practice. He there-

fore advises that the interrupter be connected with the battery and operated by an assistant.

The operation of the instrument is exceedingly simple and requires no special experience. The magnetized end of the extractor is brought in contact with the tube in the larynx, and will draw it out at any angle through the mouth. As an iron gag may interfere with the working of the magnetic tube extractor, one made of brass is preferable.

In a personal letter to the editor of this Department, Dr. Wetherla states that he has used this magnetic tube-extractor about fifty times, and that it has never failed to bring out the tube; and even when it was used by the inexperienced he has not seen it fail in the extraction. Instead of the nickel-plated tubes he now has them enameled, and some of these he has already used a dozen times without being affected by rust. Instead of using a plunge or storage battery, Wetherla has had a portable dynamo constructed, which is operated by the hand. In addition to its application for the electro-magnetic tube-extractor, this dynamo will light an eight-volt incandescent lamp, and may be used for heating electro-cauteries.

The use of the electro-magnet for the extraction of the laryngeal tube has recently been further extended to the removal of magnetizable foreign bodies from the larynx, trachea, and the esophagus, and even bronchial tubes. Unfortunately, however, the electro-magnet, to be of sufficient strength, must have a very large number of coils of insulated wire to develop the necessary magnetism in the iron core, and which therefore necessarily makes it a very bulky instrument. The electro-magnet force, moreover, diminishes very rapidly as the soft iron leaves the core in which the electro-magnetic effects are generated, so that satisfactory effects are obtained only when the working point is near the coil. On the whole, however, the electro-magnet is a useful addition to the armamentarium of the laryngologist, and it may be of great value.

As an illustration of the advantage of the electro-magnet in this connection, may be cited the case of Drs. Garel and Gouilloud (*Clou fixé dans la bronche droite depuis deux mois*, Lyon, 1901), in which a nail, lodged in the right bronchus for two months, was removed by means of the electro-magnet after a preliminary tracheotomy. More recently the usefulness of the electro-magnet has been attested by Dr. A. W. DeRoaldes of New Orleans, and by Dr. Ferdinand Massei of Naples, the latter in a brochure recently published (*A proposito di un corpo estraneo nell' esofago e di un altro in trachea*), giving an interesting résumé of this subject.

## DERMATOLOGY.

EDITED BY ALBERT C. GEYSER, M. D.

*Depilation.*—The Medical World for July, under the above heading, prints the following:

"The extended experience and experiments of the best skin specialists in the world have utterly failed to produce any compound that may be applied to the skin and permanently remove the hair without injuring the skin. The electric needle will permanently remove superfluous hair through a long, painful, tedious, and expensive process; but generally unsightly pits remain at the site of the hair follicle, which are a worse disfigurement than the hair—they look like a concentrated colony of hypertrophied 'black-heads.' Every follicle must be punctured by the hot needle, and the torture is exquisite enough to prevent any patient having more than thirty or thirty-five hairs removed at a single sitting, and such a séance occupies an hour or more."

[It becomes our duty to correct the above statement. It is true that the electric needle will permanently remove superfluous hairs, but it is not a long nor painful process; neither does it leave unsightly pits; neither is it correct that only thirty to thirty-five hairs can be removed at one sitting on account of the pain endured by the patient. To set the editor and his readers right on the subject, we add an extract from a lecture given before the class in the New York School of Physical Therapeutics]:

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### *How to Remove Superfluous Hair by the Electric Process.*

The outfit necessary for this procedure is a galvanic battery of not more than three to six cells if the same are in good order; a current controller, a milliampere meter correct in its readings and capable of indicating fractions of one milliampere; two conducting cords, the one from the positive pole to be connected with a sponge or other body electrode about six by six inches square, the negative cord to be attached to a needle holder equipped with a make-and-break device and a needle especially made, having a steel shank ending in the finest steel brouche, from one and a half to two inches long. This needle should be a trifle thicker than the ordinary coarse hair in a man's beard. The patient should be seated in a comfortable position, exposing the parts to be operated upon to a strong daylight. Procure next a small china dish, such as a saucer, and a burning candle or taper; allow the flame to come in close contact with the center of the plate, so as to receive a

deposit of the lampblack. When a spot about one inch in diameter has been blackened, add two or three drops of sweet oil and mix, making a black paste; apply the same to the surface or field of operation, and rub it well into the pores of the skin, and then wipe the surface with a peldorf of dry cotton. Each hair follicle will now appear in bold relief, enabling the operator to dispense with a magnifying glass.

Moisten the pad or body electrode in a warm solution of bicarbonate of soda, and apply at any convenient place in close proximity to the field of operation—between the scapulæ or on the sternum, when body conformation will permit, are favorable locations. Grasp the needle holder in the same manner as when holding a pen for writing, steady the skin of the patient with your left hand, and cause the needle to enter the selected hair follicle in a parallel direction to the growth of the hair; close the current connections on the needle holder and by means of the rheostat turn on the current until the meter shows a reading of one and one half to two milliamperes. Allow this current to flow until a white froth or foam appears bubbling from the point of insertion of the needle. The effect will be induced and the operation for each hair completed in from ten to fifteen seconds. Break the current and remove the needle. With a pair of tweezers take hold of the hair, when, if with gentle traction and without sensation to the patient the hair comes away, the hair follicle may be considered as having been successfully destroyed. Should traction, however, be required to remove the hair, the result will be followed by a return of the hair and the operation will have been a failure.

Each hair is operated upon in the same manner, observing the rule that, at least one-quarter inch of sound tissue should intervene between the hairs.

The number of hairs that can in this manner be removed will depend entirely upon their location, size, and color, and, last but not least, the effect produced upon the operator's eyes. From forty to sixty hairs can be removed without discomfort to the patient and operator, requiring in all about thirty minutes. The entire process is entirely without suffering on the part of the patient, and when properly performed should leave absolutely no scarring. Out of one hundred hairs removed eight to ten will require a second application.

The after-treatment consists of a thorough but gentle cleaning of the surface with cotton or a sponge and tinct of green soap, followed by clean water and a solution of H<sub>2</sub>O<sub>2</sub> in water about fifty per cent. strength; wipe dry and use any dusting powder preferred. The sitting may be repeated every third day, always avoiding too close a proximity to the previous punctures.

The writer has treated in the above manner between forty

and fifty cases, and removed by actual count upwards of 35,000 hairs, has never had but one patient complain of pain, and that patient was a man.

A. C. G.

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## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D.

*The Curative Effect of the X-Rays on Callous Sinuses of the Abdominal Wall.* D. Berry, M. D., British Medical Journal.

Persistent sinuses of the abdominal wall, where no foreign body is present, are a great annoyance both to operator and patient. In two cases I have found these heal with marvelous rapidity after a few exposures to the X-rays, and thus think the experience worth recording for further trial. The fact of this action was stumbled on by accident, as follows:

A patient, Mrs. S., was sent me from Singapore by Dr. Leask with a persistent sinus in the abdominal wall, after an incision in the right iliac fossa to evacuate bloody fluid of unknown origin. This sinus was five to six inches long, and ran from near the anterior iliac spine downwards and inwards to the uterus. It had existed for several months. In order, if possible, to see how it ran, I asked Dr. Dawson Turner of the Edinburgh Infirmary Electrical Department, to take an X-ray photograph (a probe being placed in the sinus and one in the uterus). This did not help one much topographically, as to the sinus, but I was struck with the almost magical cicatrization of the sinus after plugging with iodoform gauze for several weeks had failed.

In a second case operations for extraperitoneal gestation where fetal bones had been retained for five years the patient was sent out well, but with a narrow sinus into the shrunk sac. This did not heal as I had hoped, and the patient was again sent into Ward 36 with a sinus admitting the index finger. In my absence Dr. Milne Murray ordered the application of the X-rays, and a cure was effected after three exposures. I have since learned indirectly that this sinus has reopened a little. It is possible there may be some bone present.

It seems to me advisable, therefore, to record these two cases, so that a further trial may be given to a form of treatment now available in most large hospitals.

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*Present Status of the X-Ray as a Means of Diagnosis and as a Therapeutic Agent.* By Dr. A. D. Beavan of Chicago, in the Med. Record of July 5, 1902.

He showed a very fine collection of photographs, and quoted some remarkable figures of results obtained from the use of

X-ray. He says that every hospital should have an X-ray expert. Burns were almost certain to occur, and that a good operator was not responsible for them. No good results were to be had in deep-seated carcinomata, but the superficial type, in which the skin had been broken, often responded to the ray as if by magic. There was very great danger, however, that the lay public would get the idea that in the ray they had an agent which would deliver them from the knife. This would do infinitely more harm than the ray could possibly do good.

In the American Electro-Therapeutic and X-ray Era, O. B. Morrell reports a very interesting case of Melano-Sarcoma treated in many ways and at last subjected to the X-ray treatment. The doctor gave his patient 119 treatments with low vacuum tubes, but after varying success and failure his patient died. Owing to the great rarity of these cases it is a pity that she could not have been in the hands of an expert while he was learning how to run his machine, as the results might have been different. It is well known that if a cancer of this kind is to be managed successfully it must be done in a positive and decisive manner. The disease was allowed to get from under control and a favorable result in a case of great scientific value lost, while he was breaking tubes and learning to make rays.

In the same journal Dr. E. E. Prescott reported a case of ankylosis of the arm and hand which had resisted all other treatment, but after six exposures of seven minutes with a medium soft tube he was surprised to find motion in some of the fingers, and up to the time of the report the case was improving rapidly.

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In the Medical Record of July 5, 1902, notice is made of a paper read by Dr. W. B. Coley of New York on "The Influence of the Roentgen Ray upon the Different Varieties of Sarcoma." He had treated ten cases recently, in all of which there had been very marked improvement. Some do well when the toxin treatment is added to the ray treatment. Although it might be true we could not cure sarcomata, when one recollects that a majority of them occurred in inoperable sites, it was at least gratifying that we had in the ray an agent of great inhibitive power. Dr. Richardson of Boston had sent several cases that seemed absolutely hopeless to Dr. Coley, and many of them had returned well.

Dr. Gerster seemed to be somewhat pessimistic and claimed that the old German surgeons obtained as good results with their crude methods as we do to-day, and claimed the cases cured were probably only syphilitic deposits, and not cancer.

*The X-Ray and Finsen Light, its Utility and Limitations.*  
British Med. Journal.

Malcolm Morris and Ernest Dore give their experience during the past two years with the X-ray and the Finsen light treatment in various skin lesions as follows:

We may, therefore, say at once that although in our opinion, the results we have obtained have fully justified the employment of the treatment, and in some cases no other treatment could have produced such good results, we do not regard them as the only method to be used in all cases, nor advocate them indiscriminately, to the exclusion of other methods. But when used judiciously and combined with other treatment when necessary, we may perhaps claim for them the first places in the treatment of the majority of cases of *lupus vulgaris*. The cosmetic effect is all that can be desired, no other method superseding it, while in reliability it yields to none. All cases under treatment have made a steady improvement; relapses so far have occurred only when the treatment was discontinued before all lesions had been properly subdued. It is rather difficult in some cases to prognosticate just when all the recurrent nodules are under proper control. In this respect the light treatment appears to have an advantage over the X-ray in that the light may be applied much more frequently without the danger of any possible harm resulting from other treatment.

The chief points in the disadvantage of the Finsen light are the length of time required for each treatment, the small area treated at one time, the elaborate and expensive apparatus required, and the large staff of attendants necessary. The French lamp of Lortet and Genoud, however, does away with a great part of the objections cited, but the action of this light, not being concentrated, is very feeble in comparison and is therefore too superficial in its action.

The X-ray does not seem to replace the light, for in some cases the resulting scar tissue had a greater tendency to contract, while that from the light was more pliable and resembled the normal skin.

[This does not appear to be the fault of the source of treatment but rather the result of too vigorous and prolonged treatment.—ED.]

The X-ray has a slighter selective action on diseased tissue and a greater action on normal tissue than the light; instead of the light causing a growth of hair, the X-ray has rather a destructive action; neither has it the germicidal action of the ultra violet ray.

In ulcerating surfaces, however, the X-ray possesses a distinct value, in that healing is much more prompt. The same may be said of mucous membranes inaccessible to the light.

The lesions showing the best results so far are rodent ulcer, lupus vulgaris, lupus erythema, sycosis, and some forms of acne.

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*Radiotherapy for Cancer and Other Diseases.* By William J. Morton, M. D., Medical Record, May 24, 1902.

In the course of his discourse Dr. Morton said: "The sole point I wish to emphasize here, and it is an important one, is that radiotherapy is by no means, as seems to be commonly believed, to be confined to exterior and superficial diseases and conditions, but is equally applicable to diseases of the interior, like internal cancer, and, in general, to internal diseases.

" Included in the specific influence of X-radiation is also naturally a bactericidal action, which the experiments of Rieder and many others have established beyond doubt. . .

" It is the X-ray itself which sets up dermatitis, produces necrosis, or, when properly used, cures disease. The cathode rays do not escape from the vacuum tube. I cannot believe that, as claimed, the electric pulsations given off from the tube exert a harmful influence. On the contrary, I believe that they benefit the patient, in accordance with the well-known laws of the therapeutic effects of high-potential currents. In this respect, indeed, they should act as an offset to any baleful influence of the X-ray, and possibly, at times, to its curative influence. Regarding the electric vibration, therefore, in this light, I do not consider it essential to employ an aluminum grounded screen, or if I should employ the screen, it would be for the purpose of cutting off the beneficial, not the harmful, effects of the X-ray.

" Turning to a consideration of the principal disease to which we would apply the X-ray, it would greatly hasten therapeutic progress if we had any adequate knowledge of what the pathology of cancer is. However, in this respect the physician can be said to be groping in no less ignorance than is the physicist, in regard to the true nature of his X-ray.

" As practitioners, therefore, our attitude must be almost entirely empirical and clinical, and we must feel our way along with careful experimentation and observation.

" The X-ray from the soft tube possesses but little penetrating power; its shadow picture presents 'black bones'; its radiation is quickly and superficially absorbed by the tissue; it has slight therapeutic value.

" The X-ray from the medium soft tube transforms most of the electrical energy imparted to it into X-ray energy; its shadow picture is sharply defined and the one most commonly desired and obtained; its radiation has a good penetrating power, though much of it is absorbed by the integument; it should, therefore, be employed when we wish to produce an effect upon the skin."

Of the vacuum tubes he said:

"The sole point to weigh, I imagine, as to the entire question of vacuum is, at what part of the patient's body do we wish to have a transformation of X-ray energy into chemical energy. If in the integument, then we would use a medium soft tube; if deeper, a hard tube. Personally, I may say, I lean in my preference toward a hard tube in all my treatments."

Of the exposure he said:

"There is no evidence to justify the assumption of an idiosyncrasy on the part of the patient to dermatitis, ulceration, or necrosis. We should, however, keep in mind that the skin of the face and hands is more susceptible than that of other regions, that the mucous membrane is more sensitive to the ray than the skin, and that areas of existing inflammation are the most susceptible.

"The general effect of an exposure is, as has been said, to produce, when carried to extremes, the common symptoms of inflammation. When not carried to extremes, or when used within other therapeutic limits, I suppose the effect to be due to a reaction in the vital tissue processes (metabolism), ascribable to having set up new chemical exchanges. If metabolism is the sum total of all the chemical exchanges which take place in a living animal organism; and if, secondly, the X-ray effect is a transformation of X-ray energy into chemical energy, then the conclusion seems inevitable that the effect of the X-ray in the cure of disease is due to a primary chemical reaction, affecting in turn the metabolic processes. How far the dissociation of the common atom and the molecule into the ion enters into this explanation, should be in time easily demonstrated. For my own part, I believe that scientific analogy points to the action of the X-ray as one of ionization. X-ray dermatitis and necrosis are too familiar to require description here.

"I have noted two rather constant reactions in the treatment of cancer. The first, occurring in general carcinomatous infection, may be termed an early reaction period. In this the temperature may rise from 1 to 2° F., the pulse is increased in frequency, and the patient experiences 'nervousness' and unrest and an increase of general fugitive pains. But the rule is an immediate cessation of pain, and within a few days the disappearance of small nodules, to be followed by the later reaction next referred to.

"The late reaction is local and shows itself at any time in from one to three weeks, and seems to resemble in this respect the familiar effects of dermatitis. This reaction is in reality the first objective evidence of a retrogression of the new growth (carcinomatous or sarcomatous tumor).

"Cases of failure to secure any improvement in sarcoma within eight or nine days have been reported. In all such cases the lateness of a possible reaction must be kept in mind.

"The time of exposure depends primarily upon the intensity of the X-radiation. Our effort should be to standardize every step of treatment. If we use a coil, we must know the volts and amperes and number of interruptions per second; if a static machine, the number and diameter of the plates and the number of revolutions per minute. With these data an established and constant quantity, we should adopt a standard intensity of X-radiation, a standard distance of the tube from the patient's skin, and a standard duration and frequency of application.

"Instruments to measure fairly well intensity of penetration have already been devised, based upon Professor Röntgen's original suggestion, and we may soon be able to buy them.

"Roughly speaking, I select a tube just beginning to be hard (corresponding to from five to seven inches spark-gap of the coil), giving a good photographic picture of the hand in one minute at a distance of two feet, and equally clearly giving a good fluoroscopic outline of the skeleton of an average man at the same distance. I select a distance of eight inches and a duration of from six to eight minutes, and give it treatment three times a week. In this manner, where sound skin intervenes, I usually get a dermatitis of a mild type in from one to two weeks. This dermatitis I do not fear, but, on the contrary, anticipate producing. But now, instead of stopping treatment, I go right on (shifting the central focus of the tube, however, often) until I have converted a bright erythema into a brown and often, in brunettes, into a blackish 'tan.' The patient once properly 'tanned,' it is extraordinary how great an intensity of X-ray may be administered. In some of my patients whose skin is already tanned as black as a dark mulatto's, I am giving treatments of from eleven to fifteen minutes, three times a week, with no harm to the skin. I think the effect is exactly the one aimed at by the bare-backed and bare-armed oarsman, who systematically tans his body. Daily and short exposures to the sun soon enable him to defy its hottest rays, whereas one single, first and long exposure would set up blisters and ulcerations and cripple him for weeks.

"However, I wish here to distinctly put myself on record as refusing to advise anyone else to 'tan' a patient with the X-ray. It is a process that each must judge for himself and decide accordingly. It is mainly, however, a question of systematic and standardized technique. It is commonly advised, I am well aware, to cease treatment as soon as dermatitis sets in, but for the reasons given above, I have discarded

this advice. After the skin has been hardened, say at the end of two to three weeks, I give ten to fifteen minutes' treatment three times a week. In cases of internal cancer, it would be impossible to succeed unless we could continue in spite of the erythema and tan the patient as described. On the whole, as to frequency and intensity of treatment I would say, feel your way along the first two weeks; force your way the next two weeks and after. And, following this general advice, certain cases of exterior cancer, or interior cases, where the same area of skin is not necessarily constantly subjected to radiation, may be X-rayed more frequently, and even daily.

"Finally, as a last word in regard to technique, I cannot protest too strongly against the submission of a patient to X-ray treatment by unskilled hands.

"The outfit, like the surgeon's knife, is a simple one, but the outcome, in the hands of the immature operator, is as if the surgeon should turn over his scalpel to the nurse. It is the state of the vacuum and the consequent quality of the radiation produced which is both the fickle and the dangerous feature of administration. At one moment with one tube a radiation flashes forth which cuts down animal tissue as does the hot wind of Sirocco cut down plant tissue life. At the next moment, or with another tube or vacuum, a deceptive ray glows to the eye at the fluoroscope, and yet has little or no effect upon the disease. There is always some danger, even in skilled hands, and likewise uncertainty enough, but, in unskilled hands, the danger is as unpleasant to contemplate as is the report of results obtained, valueless.

"In such hands a negative result has no meaning, an affirmative result is an accident. It would be wise if a school of instruction for X-ray workers could be established.

"The X-ray worker from his standpoint, may classify his cases naturally, according as they are: (1) Exterior; (2) Interior; (3) Operable; (4) Inoperable.

"1. Exterior.—When the disease has involved the skin, or the skin has broken down, the case is exterior. When, on the other hand, healthy skin covers the new growth or other disease, the case is interior. The operable and inoperable classification explains itself.

"In exterior cases, as for example, of epithelioma, papilloma, rodent ulcer, lupus, etc., the effect of the radiation may be closely watched. A shield protecting the sound skin is desirable, though I see no reason for insulating it.

"In this class of cases the indications of experience thus far gained fully justify a resort to the X-ray in preference to any other treatment. True, a small and isolated epithelioma may sometimes be preferably cut out or scraped out or be treated by caustics, but, on the other hand, cases of large areas of destructive and advancing epitheliomas and lupus have al-

ready been reported in great number, where nothing yet known except the X-ray would have saved the patient from extensive surgical mutilation and possible death.

"2. Interior.—In interior cases the operator's hands are tied, and his efforts are limited by the fear of breaking down the normal and intact integumental tissue. It is here that the 'tanning' process may be resorted to, as, for instance, in osteosarcoma, and in carcinoma of the breast and other tumors either immediately or remotely underlying the skin. In these cases the high-vacuum tube, with its deeply penetrating X-ray, is indicated.

"And in these cases, I have no hesitation in claiming that the X-ray has an immediate and continuous effect of relief from pain and circumscription and retrogression of the disease.

"In two cases of malignant growth at the pyloric orifice of the stomach, the pain has entirely ceased, and the patients can, for the first time in many months, take solid food.

"In two cases of epithelioma within the fauces, and necessitating treatment through the skin, the sensations of burning and discomfort have ceased, the tumors are reducing in size and, to say the least, an advancing disease is arrested in its progress. The same statement applies equally to cancer of the rectum and of the uterus. Will these cases be cured? I frankly say I don't know. Their treatment has not yet extended over a sufficient period of time, and it is, therefore, too early for me to venture an opinion.

"In another class of 'inferior' cases, namely, carcinoma of the breast, the results thus far obtained are most hopeful. One recurrent-carcinomatous tumor of the breast I have reported cured, and it remains cured to date. Three other cases of this type, not yet reported, exhibit now no tumors and no symptoms of cancer. They seem to be cured. Unfortunately, of a large number of such cases I am treating, all but one, just beginning treatment, are of long standing. Their behavior varies. In some of them the ulcerations have already healed with a clean cicatrization; scattered nodules, hardened and reddened areas have softened and disappeared, indurated glands are no longer to be found, and pain, of course, disappeared very early.

"In only one case has merely moderate progress been made in reduction of the size of the tumor. This tumor is of stony hardness, attached to the periosteum of the ribs, and of intense redness. The case is inoperable. This much, however, even in this case, has been gained. Previously, at each menstrual period the tumor increased at least one-fifth in size. Now, two periods have passed and the tumor is somewhat smaller, and certainly more movable.

" I am, furthermore, treating a patient with appendicitis, who was suffering daily pain and advised to submit to an immediate operation, but who has presented no further symptoms of the disease from the first week of treatment, except one mild attack.

" As a further instance of interior effect, I have treated and cured two patients with melancholia by X-raying the brain, and relieved a tic douloureux, which has undergone two operations to remove the nerves, by X-raying the casserian ganglion.

" There is, therefore, no question in my mind, but that the X-ray should be employed in interior and in internal cancer and other diseases internally located.

" 3. Operable Cases.—In so-called operable cases of cancer, particularly those of carcinoma of the breast, the propriety of employing the X-ray will, no doubt, be long a debatable ground. For my own part, I now believe that no case should be operated upon until it has first been treated by the X-ray, and for these reasons:

" (a) The earlier a case can be treated the more rapidly it yields to the influence of the X-ray.

" (b) The infective process (distribution and growth of the cancer particles) often ceases under X-ray treatment; the proof of this assertion lies in the fact that this process, even when fully developed, may be arrested by the X-ray, and visible carcinomatous nodules and kernels disappear, while no new ones occur.

" (c) Circumscription of the area of invading disease, retrogression of the growth, and relief from suffering can be confidently predicted.

" (d) So long as a malignant growth continues to improve under X-ray treatment no operation is necessary.

" (e) Of the two, the X-ray and an operation, the former appeals to the patient as an infinitely preferable procedure, and should it fail no valuable time has been lost.

" (f) A sufficient number of carcinomas of the breast, of sarcomas, and of epitheliomas cured, have already been reported, to justify a claim that the percentage of permanent recoveries may compare favorably with the results attained by a surgical operation.

" Conclusions.—1. Radiotherapy broadens our conceptions of the possibilities of the therapeutics of modern medical science.

" 2. The X-ray has a general application for the relief of pain.

" 3. As to technique, a standardization as to apparatus and its capacity, and as to duration and frequency of treatments and distance of the tube, is recommended to operators.

" 4. The X-ray has a curative effect in internal cancer and other internal diseases.

" 5. For superficial diseases a medium soft tube may be used, for internal cases a hard tube. The hard tube is applicable, however, in all cases.

" 6. X-radiation is recommended prior to any operation, to clear the tissue of cancer particles and foci, and to circumscribe the disease.

" 7. X-radiation is recommended after operation to preclude a recurrence.

" 8. X-radiation may be recommended in place of an operation, and may be preferable to one for the reason that operation secures but a comparatively moderate percentage of permanent recoveries, and because up to date the X-ray procedure shows a continued improvement in cases, and a percentage of cures which will, undoubtedly, compare favorably with surgical operations.

" 9. There is danger to the patient or uncertainty as to what might be accomplished when the X-ray is employed by immature operators.

" 10. In X-radiation we possess more nearly a solution of the problem of curing cancer than by any other method of treatment."

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

C. Stuart Hutchinson, in the course of a paper read before the Central District Medical Association of Iowa, refers to the use of dry hot air in the treatment of some diseases as follows:

" It has been the experience of the writer when an acute articular rheumatic member is placed in a dry air chamber at the temperature of 400° F. for an hour, the pain is relieved, swelling diminished, and comparatively free motion can be had after a thorough massage.

" The stiffness, pain, and disagreeable symptoms of muscular rheumatism are relieved after a few hot baths of the entire body (except the head), at a temperature of 225° F. Thus we may say acute articular rheumatism, muscular rheumatism, lumbago, torticollis, pleurodynia, sciatic and other rheumatic affections, with acute and chronic gout, may be relieved if not entirely cured. In dry, scaly skin troubles, where stimulation is required, diaphoresis can be produced and relief often follows.

" In sprains of ankles, wrists, knees, or elbows, nothing can compare with the relief obtained from a treatment of dry hot air at the temperature of 450° to 500° F. It relieves pain, diminishes swelling, and permits free massage. In spasmotic

affections involving the muscles a local appliance of heat relieves much of the distress.

"Dysmenorrhea due to the neuralgic or rheumatic diathesis, inflammation within the pelvis, and parenchymatous nephritis may be relieved by increasing the elimination through the skin and bowels. Repeated baths cause functional hypertrophy of the sweat-glands and eventually enable them to do more work. In colds the congestion of the nasal mucous membrane can be relieved by one treatment. Syphilitics obtain the same result as from the Hot Springs.

"Chronic ulcers are stimulated by heat, and with cleanliness granulation will be produced and often permanent cures established. Recent literature shows that a reduction of the obese can be accomplished with heat more rapidly than with drugs. However, care must be taken with those suffering from fatty degeneration or marked valvular lesion of the heart, on account of the stimulating effect on the circulation.

"In no case do I rely entirely on the heat alone, but employ such measures, either medical or surgical, as the case requires; enforcing hygienic rules and correcting dietetic errors."

The editor of The Alkaloidal Clinic, in which periodical Dr. Hutchinson's paper was published, appends the following to the article:

"Dr. Hutchinson is not the only one who has become justly enthusiastic over the results of hot-air treatment. I cannot comprehend how a progressive, up-to-date physician can permit his competitors to monopolize this useful invention."

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## RADIOGRAPHY.

EDITED BY HERMAN GRAD, M. D.

*Nephrectomy, Subsequent Nephrotomy, and finally, Suprapubic Cystotomy.* By Dr. E. D. Ferguson of Troy, N. Y., our-  
nal of the Am. Med. Ass., July 5, 1902.

History of the case. On February 8, 1901, a boy aged eight fell from another boy's shoulder. Three weeks later a painful swelling appeared in the right hypochondriac and lumbar region. A trochar was introduced into the swelling and a supposed cyst evacuated. This procedure resulted in a permanent urinary fistula in the right loin. Nine months after the date of injury the patient came under the author's observation. The patient was subjected to radiography, and the picture showed two small calculi in the right kidney and one somewhat larger in the left. As there was no evidence of disturbance from the calculus in the left kidney the author decided to do a nephrotomy on the right side and remove the two calculi which caused the disturbance. On November 15, 1901, the operation was undertaken.

"Operation. On reaching the kidney, the organ was found of normal size and consistency, but the fistula entered at the pelvis, and the upper portions of the ureter and pelvis were matted into the walls of an abscess cavity, so that to recognize the parts and to separate them and make a probable successful effort to close the urinary fistula seemed impracticable, while to open the kidney and remove the calculi, leaving the mutilated organ in the pus-producing field, with an eventual permanent fistula, seemed worse than the picture of its removal. Though the error of operating first on the fistula side was at once painfully apparent, I proceeded to complete the operation by doing nephrectomy, hoping the calculus in the left kidney would continue its state of quiescence for a long period. The progress of convalescence was without an unpleasant symptom, the walls of the pus cavity having been removed as freely as practicable and the upper extremity of the ureter having been sutured toward the skin, so as to secure a cavity favorable to healing.

"Second operation. On December 21, 1901, from a state of freedom from pain and a condition of general well-being the patient passed into a state of agony. He was attacked with pain in the left renal ureteral and vesical regions, with anuria, proof that the calculus in the left kidney had entered the ureter and produced complete obstruction. On December 22 the pulse was found to be 180, temperature 104° F. The prospect of success in the severe mutilation of the one remaining kidney incident to the removal of the calculus, that was believed to be too large to pass through the ureter, was not such as to justify enthusiasm in the operation, but he was prepared promptly and the work was undertaken. After the kidney was isolated so that palpation was available, it was necessary to follow the ureter for more than two inches before the stone was felt. It was practicable to carry the calculus up into the pelvis by upward pressure of the finger, and the problem of its extraction was considered. Steadying the calculus within the pelvis I guided a scalpel so as to make a short longitudinal incision from the convex edge near the center of the organ, and so that the pelvis was opened. Into this puncture, for such it was, I introduced forceps, and having felt the stone, opened the blades so as to enlarge the wound. The hemorrhage was so great as to cause me to direct the immediate use of a normal salt solution into the connective tissue and rectum. With considerable difficulty the calculus was finally extracted. A soft rubber tube was placed into the pelvis of the kidney and gauze packed around it, so as to control hemorrhages, the whole being anchored to the abdominal parieties by sutures through the capsule, so as to maintain hemostatic pressure. Though in profound shock from the hemorrhages and the severity of the operative procedure, again he was

without untoward symptoms; the dreaded anuria did not materialize, and in a short time he was able to sit up in bed.

"Third operation. On February 2, 1902, the patient was attacked with pain and could not pass urine. As the radiograph had suggested a stone in the bladder the trouble was supposed to be a calculus in the urethra. The patient was anæsthetized and a calculus was found in the fossa navicularis, which was removed after incising the meatus.

"Fourth operation. We now believed the query had been worked out, and as the patient was in every way comfortable he was soon sent home, but after a little time reports of a return of dysuria and vesical pain justified his readmission, and another radiograph showed a vesical calculus of a size which seemed to demand a removal by suprapubic cystotomy. This was done on March 7, 1902, since which time he has been free from pain, gaining in every way without interruption."

H. G.

[We consider the remarkable result in the above interesting case to have been due to the valuable assistance afforded by the X-ray in diagnosing the presence of the calculi.—EDITOR.]

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*Fracture of the Carpal End of the Radius.*

D. R. W., aged eight, sustained an injury to the right wrist by a fall. Three hours later, when the patient was seen, there was some pain and swelling of the wrist joint. Diligent and careful examination failed to elicit crepitus. There was no ecchymosis present. A diagnosis of a sprain of the wrist joint was ventured and the wrist immobilized with splints; a few days later the patient left town and was not seen again until two weeks after receiving the injury. At this time it was noticed that there was a perceptible deformity at the inner aspect of the lower end of the forearm. The wrist motions as well as pronation and supination were perfect.

The skiagraph shown in Fig. 1, which follows, was taken by Dr. Beck, sixteen days after the injury was received. The picture shows a fracture of the carpal end of the radius, but apparently a faultless union and without any displacement of the fragments. A second skiagraph, however, taken at right angles to the first, shown in Fig. 2, reveals a most interesting condition. The lower fragment of the fracture is displaced and is nearly at right angles to the long axis of the shaft. This displacement caused the deformity of the lower end of the forearm. These two pictures emphasize the importance of taking two skiagraphs at right angles to each other, in cases of fracture or in any cases of X-ray studies.

The bone was refractured without anæsthesia and put up in plaster of Paris. In three weeks the union was perfect and the deformity that existed entirely disappeared. H. G.



Fig. 1.—Taken by Carl Beck, M. D. Apparatus, Coil. Tube, German.  
Distance from tube, six inches. Exposure, one-half minute.



Fig. 2.—Taken by Carl Beck, M. D. Apparatus, Coil. Tube, German.  
Distance from tube, six inches. Exposure, one-half minute.

*The Roentgen Rays in Cerebral and Cranial Affections and Forensic Medicine.* By M. Benedict of Vienna (Leipsic), Deutsche medi. Wochenschrift, June 5, 1902.

The author calls attention to radiography of the skull after traumatism causing the so-called "shock neurosis." The radiographs were taken of the side, front, and back of the skull. He finds that the bones are abnormally permeable to the rays in those regions of the skull where pressure is painful. "In pachy-meningitis the inner layer of the bones of the skull may be less permeable than normal. In cases of unilateral meningitic swelling or hydrocephalus externus the increased permeability will attract attention, while pachymeningitic hemorrhages are distinguished by the reverse phenomenon."

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### SOCIETY MEETING.

#### THE CLINICAL SOCIETY OF THE NEW YORK SCHOOL OF PHYSICAL THERAPEUTICS.

Fifth Regular Meeting, June 20, 1902. Robert Newman, M. D., Chairman.

Dry Hot Air in Therapeutics.—Dr. Clarence E. Skinner of New Haven read a paper with this title.

Mr. M. Loewenthal asked how the apparatus was heated at the present day.

Dr. Skinner: Gas is most convenient. Some are heated by gasoline, some by alcohol, and some by electricity, but the latter is too cumbersome and expensive. The amount of current required to secure a temperature of 350° F. is very great, and hence the expense. There are two forms of apparatus, one for local treatment and the other for body treatment. The local apparatus can be taken to the bedside; the other is too bulky for transportation.

Dr. Whitwell asked the difference in temperature between that noted in the upper part of the apparatus and in the lower part near the patient.

Dr. Skinner: The apparatus should be so constructed as to allow of very little, if any, difference of this kind. In many forms of apparatus the construction is so complex and so faulty that the temperature is not equalized throughout the apparatus. One which is properly constructed should not give more than five per cent. of variation in the thermometer.

readings in all parts; ordinarily, it does not actually vary more than five degrees.

Here is an apparatus intended for treating ankylosed and flexed knees. It is not possible with this apparatus to employ as high a temperature as I have indicated in my paper, for the reason that the popliteal space rests upon this bridge, and as soon as the patient begins to sweat the perspiration collects in the popliteal space, and being pressed upon by the toweling around the leg and by the bridge, it cannot evaporate with sufficient rapidity, and the perspiration acquires a boiling temperature and causes blistering.

Here is another local apparatus, the ordinary one used for treating the shoulders, chest, and other parts of the body. Here the cubic content is sufficient to admit of maintaining an even temperature. The foot, for example, is wrapped in Turkish toweling up to the knee, and the patient can turn from side to side, so that the evaporation will take place with sufficient rapidity. The heat is generated by gas, and the heat passes through the funnel at the bottom of the apparatus. If alcohol is used, it is placed in a saucer below the funnel. If gasoline is used, it must be under pressure, and this is secured by the use of an elevated air tank. There are many forms of apparatus upon the market, but the principle is the same in all. With this small apparatus we usually get a variation of 50° F. from one end of the apparatus to the other, because it is necessary to open the apparatus at intervals for ventilation. It is safe to assume that the temperature of the part treated is about 50° F. below that indicated by the thermometer at the other end of the apparatus.

Dr. W. B. Snow: It seems to me that with this exposition of the physiological action and the demonstration of the method, we have before us a therapeutic means which must appeal most strongly to all who at any time in their professional experience have tested the effects of heat in the treatment of disease. I think in the experience of most physicians the local applications of heat, as in properly applied poultices, have given results in the treatment of inflammatory processes which have generally exceeded the benefits derived from other methods employed. Personally, I may say that, in a general practice of twelve years, I found heat one of the most useful means of treating diseases of the lungs. As a rule, pleurisy is rapidly

aborted if the heat be properly administered. Failure will result from not prolonging the application sufficiently and using too low temperatures. The hot-water bottle, kept for four hours, always hot, affords so much relief in various neuralgic and inflammatory conditions that we have in it a remedy upon which all general practitioners learn to rely. We may be sure that the use of heat must, therefore, occupy a prominent place in the future treatment of disease. I think Dr. Skinner has shown very plainly why this should be so. The time cannot be far distant when physicians will feel called upon to have these large body apparatus in their offices. Pneumonia, we have been told, can be treated very satisfactorily by hot air, and if the necessary apparatus cannot be brought to the patient's home, it may be that pneumonia will become one of the diseases which will be treated in institutions. I believe in this way many lives may be saved which are now sacrificed. In our present methods of treating pneumonia it is a matter of the patient's vitality being able to withstand the attack of disease. If this vitality is sufficient, the germs finally succumb, whether they be the pneumococcus or the streptococcus. The argument presented in the paper seems to be sufficiently strong to make it seem prudent often for us to treat pneumonia in this way, or as a physician expressed it to me a few days ago when speaking of a treatment of another affection, "If they don't do this, physicians may be held criminally liable for the neglect." Dr. Skinner is laboring in a field which, in the near future, promises the medical profession therapeutic results which mean relief of much suffering and the saving of many lives which are now sacrificed.

Dr. Sigismund Cohn: I had one case of chronic rheumatism of about four weeks' standing, which exhibited remarkable improvement after the use of hot air. The disease was principally confined to the knee. After this improvement I gave the static wave current and the hot air on alternate days, and the patient was well within three weeks. In another case, one of sciatica, I used the hot air in connection with the arc lamp. After applying the arc for twenty minutes I changed to cold. I should like to know what Dr. Skinner does after taking the patient out of the hot-air apparatus.

Dr. Skinner: I never do anything after the local treat-

ment, except remove the apparatus and wipe off the skin with a towel. In some cases I used massage and the static wave current, and now I frequently use the latter. There is no reason why the cold douche should not be applied, but I have never found it necessary. After the body treatment a good deal has to be done. In the first place, the patient must remain still and allow the pulse to nearly reach the normal rate and the temperature to sink to the normal before he gets up. If he gets up before this he is very liable to have an attack of syncope or of acute heart failure. By allowing him to sit up tentatively we can determine, by the absence of giddiness and nausea, whether it is safe to allow him to remain up permanently. There being no nausea or giddiness he is to be put in a bath of soap and water, and after this is put in bed, given an alcohol rub, and left to rest for from two to four hours. This is necessary in order to procure proper rest of the nervous system, otherwise there is apt to be a disturbance of the nervous equilibrium. I treat the patient until a certain response is obtained from the nervous system, as indicated by a certain change in the pulse and temperature. My rule is to keep up the treatment until the body temperature has increased two degrees or the pulse has reached 120. If we go beyond this we usually observe evidence of overstimulation in most cases.

I wish to say that I do not think the action of air in local sepsis is due to a directly germicidal influence. I do not believe it is possible to raise the heat of the interior of the body to the point which will destroy germs, but I do believe we secure a tremendous increase in the metabolic activity of the body and in the cell elements which are thus able to check the infection or wall it off. I recall very vividly one case of local infection with very severe systemic toxæmia. The infection occurred in the space between the middle and third fingers, and had involved the lymphatics of the arm; the glands in the axilla were very much swollen. The temperature of the patient was between 104° and 105° F. He was brought into the sanitarium and received immediately a body treatment. He at once began to improve, but the body temperature remained between 99° and 100°, and the pulse between 80 and 85 for five days. We could not detect any fluctuation in the axilla, though the glands remained enlarged. At the end of five days we dissected out the glands, and found an abscess about

twice as large as a walnut. The pyogenic membrane surrounding this cavity was unusually thick. The increase in the leucocytes induced by the body hot-air treatment I think combats the sepsis through the increase in the metabolism and cell production dependent thereon.

In order to appreciate the action of hot air in pneumonia we must consider the pathology of this disease. I think that Professor Andrew H. Smith's idea is most interesting and convincing, *i. e.*, that in pneumonia the alveoli of the lung resemble a test tube in which there is a culture medium. The pneumococcus is especially susceptible to changes in temperature. When the lung is consolidated the pleuræ are frequently glued together by fibrinous exudation, and there is practically a solid tissue from the outside skin to the inner limit of the consolidated area. Under hot-air treatment the heat is carried over this whole area with a consequent increase of temperature of this area, perhaps amounting to two or three degrees, perhaps more. The first thing noted under the treatment is relief of pain. In about twelve hours there is less flatness on percussion and râles are heard. In another day there may be almost no dullness remaining. However, the duration of the disease is not shortened. Some râles will remain, the temperature will be elevated, and the pulse will be accelerated until the disease reaches its period of normal defervescence. In a consolidated area there are new colonies of germs spreading toward the periphery, in other words, where the germs are growing there is no consolidation, and we cannot reach this portion with the hot air. Unfortunately this is the area containing the most virulent germs, and these germs keep up enough systemic toxæmia to account for the disease continuing for a few days.

Mr. Max Osterberg: In speaking of the apparatus, Dr. Skinner told us that it must be opened from time to time to allow of the escape of air and moisture from the patient. Why is this so when there are three distinct methods of avoiding this, viz., by the chemical absorption of moisture, by introducing fresh air through tubes, or by an electrostatic discharge, which will cause precipitation of moisture on the bottom of the apparatus?

Dr. Skinner: When the hot-air apparatus is started the moisture which causes trouble is from the condensation of gas.

This can be avoided to some extent by the use of electricity. After the apparatus has become heated, the only moisture to be removed is that from perspiration, which is absorbed into the toweling and heated. Chemical means have never been tried, and I doubt if they would be of practical value under these conditions. The absorption would certainly have to be carried on very rapidly.

Mr. Max Osterberg: If the electrostatic discharge is produced within the apparatus between two terminals, the air within the apparatus will be set in motion, and this will favor the precipitation of the moisture on the bottom of the apparatus.

Dr. Skinner: This would be practicable only when there is an electric current at hand, or an induction coil, and hence such apparatus could not be used in most private houses. The moisture must be removed within three minutes, otherwise blistering will result, but any means that will accomplish this will answer.

Dr. Milton W. Franklin: A static discharge might precipitate the moisture, but the latter would not remain precipitated ten seconds in that temperature. It is true that the effect of the static discharge is to effect a precipitation in the atmosphere, but in the temperature found in this apparatus it would not be precipitated. There is no chemical known which will retain moisture at the temperature used. The principle of exhausting Crookes' tubes and other apparatus by means of chemicals absorbing moisture depends for its efficacy upon keeping these tubes red hot and permitting the chemical to cool after the sealing of the tube; it is then only that the chemical produces the desired absorption. The method of keeping the apparatus dry by ventilation is impracticable, I believe, from a mechanical point of view, for I know of no means by which air can be supplied at such a high temperature, and if this were not done the temperature of the apparatus would be reduced by the incoming cool air.

Dr. Skinner: Let me now demonstrate to you the method of giving a hot-air body treatment. This is a case of tuberculous inflammation of the knee joint of three years' duration. On coming under observation there was almost no movement of the joint and there was more or less pain. At that time, five weeks ago, there was a body temperature of 99.5° F. to 101° F., pulse about 90 constantly, and he was very thin. Since the third treatment there has been no elevation of temperature, and for the past three weeks there has been no pain. He can now flex the limb to an angle of 45° and he can

walk on the leg without pain. He has gained several pounds in weight. He has received altogether seven body and six local treatments. The patient should be wrapped in a cheap grade of Turkish toweling, because, in order to secure a sufficiently rapid evaporation of the absorbed perspiration, the toweling must be of loose texture. About three thicknesses of toweling are placed over the toes and the body. His pulse before treatment is 72 and the temperature 99.4° F. During the treatment we allow him to drink as much water as he pleases, giving it, however, only in very small quantities. After the treatment, you notice, his pulse is 100 and his temperature 100.4°, and he is distinctly drowsy. The thermometer at the distant end of the apparatus is at 275° F., and the one placed near the patient's body registers 250° F., but as the heat was turned off a few minutes before reading the latter it is hardly a fair record of the temperature conditions actually obtaining during treatment.

The Use of Electricity in Habitual Constipation.—Dr. Sigismund Cohn read this paper.

Dr. J. G. Davis: I certainly approve of this method, having been very successful with it in relieving constipation.

Dr. W. B. Snow: I wish Dr. Cohn would demonstrate his method of using "the swelling method," for I think this has much to do with the re-establishment of the healthy peristalsis.

Dr. S. Cohn: This is accomplished most easily and gradually by tilting one of the conductors of the static machine alternately upward and downward, and in this way removing it slowly from the other pole and bringing it just as gradually toward that pole again. The change can be made more smoothly than by the usual method of shifting the conductors horizontally.

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## BOOK REVIEWS.

A GUIDE TO THE MICROSCOPIC EXAMINATION OF THE EYE. By Professor R. Greeff, Surgeon to the Ophthalmic Department of the Royal Charite Hospital, Berlin. Translated by Hugh Walker, M. A., M. B., C. M., Assistant Surgeon and Pathologist to the Ophthalmic Department of the Glasgow Royal Infirmary. Published by P. Blakiston's Son & Co., 1012 Walnut Street, Philadelphia, Pa.

This is an extremely interesting and comprehensive little volume, in which Professor Greeff treats with great thoroughness each detail of the microscopy of the eye. The book is well arranged, and has one of the greatest of all virtues in a text-book, in that it takes nothing for granted, but carefully brings out every point of the laboratory technique in a clear, concise manner. The work is replete with valuable figures for hardening and preparing material and stains for the different tissues of the eye.

**THE NEUROSES OF THE GENITO-URINARY SYSTEM IN THE MALE, WITH STERILITY AND IMPOTENCE.** By DR. R. ULTZMANN, Professor of Genito-Urinary Diseases in the University of Vienna. Second Edition, Revised, with notes and a supplementary article on Nervous Impotence, by the translator, GARDNER W. ALLEN, M. D., Surgeon in the Genito-Urinary Department of the Boston Dispensary; Instructor in Genito-Urinary Surgery in Tuft's Medical College. Illustrated. Pages 198. 12mo. Price, extra cloth, \$1.00, net, delivered. Philadelphia: F. A. Davis Company, Publishers, 1914-16 Cherry Street.

The subjects treated in this volume are of so much importance, and the literature so scant, that the translation of Dr. Ultzmann's valuable work must be most acceptably received. In Part I the intimate relations of the urinary and sexual apparatus are shown, as influenced by the nervous system, together with the influence of the psychic side of man's nature. Part II treats of sterility, and impotence arising from different causes, together with its ætiology, pathology, prognosis, and treatment. The methods of treatment are conservative, rational, and scientific. The publishers have made the work most presentable and attractive.

**THE INTERNATIONAL TEXT-BOOK OF SURGERY, BY AMERICAN AND BRITISH AUTHORS.** Edited by J. COLLINS WARREN, M. D., LL.D., Professor of Surgery in Harvard Medical School; Surgeon of the Massachusetts General Hospital, and A. PEARCE GOULD, M. S., F.R.C.S., Surgeon to Middlesex Hospital; Lecturer on Practical Surgery and Teacher of Operative Surgery, Middlesex Hospital Medical School; Member of the Court of Examiners of the Royal College of Surgeons, England. Vol. I. General and Operative Surgery, with 458 Illustration, in the Text and 9 Full-page Plates in colors. 500 pages. Published by W. B. Saunders & Co., Philadelphia and London. Price, cloth. \$5.00 net, per volume; sheep or morocco, \$6.00.

This volume adds another valuable text-book to medical literature. The large number of able writers who as workers are doing so much to advance surgery to-day are a guarantee to the excellence of the work. It combines the progress of two continents, making it a work of especial value to both surgeon and practitioner. Probably in no subject to-day is the necessity for investment in advanced literature so great as in the medical profession, and few works will better fill a place in literature than this. It is comprehensive, concise, and practical. The cuts and plates are numerous and of a high order of excellence. The editors and publishers, as well as the medical profession, are to be congratulated on the appearance and merit of the work.

**DISEASES; THEIR CAUSES, PREVENTION, AND CURE; OR, THE SCIENCE OF LIVING.** By ALFRED WALTON M. D. Published by the Health Publishing Co., 509 Fifth Avenue, New York City.

The author's ambition, as he puts it, is "to point out how to live, that we may not invite disease." The doctor's ideals are of a high standard, but his conceptions of what constitutes disease are unique in the light of scientific investigations.

He would measure the intelligence of a community by the number of clergymen and physicians. It would seem, however, that it will be many generations, and many books will be written, before gluttonous, pleasure-seeking human nature will learn to live, or the bulk of them care to learn to live. In the light of such truth it cannot be wise to inveigh against the physician, who at the present time, and probably for all future time, must be indispensable to the comfort of humanity. That natural methods must be more generally adopted, to the exclusion of drugs, seems probable, but that the laity or the medical profession are ready for it at present is somewhat doubtful. Should this work induce a healthy turning in this direction, and not induce too much the prejudice so apt to arise when men are told that they are not of sound mind, it is certain to do the good work intended. The book is well written and published in a most attractive manner, having as a frontispiece an excellent representation of the writer.

**A SYSTEM OF PHYSIOLOGIC THERAPEUTICS.** A Practical Exposition of the Methods, other than Drug-Giving, Useful in the Prevention of Disease and in the Treatment of the Sick. Edited by SOLOMON SOLIS COHEN, A. M., M. D., Professor of Medicine and Therapeutics in the Philadelphia Polyclinic; Lecturer on Clinical Medicine at Jefferson Medical College; Physicians the Philadelphia Hospital and the Rush Hospital for Consumptives, etc. In eleven octavo volumes. By American, English, German, and French Authors.

**VOLUME IX. HYDROTHERAPY, THERMOTHERAPY, HELIOTHERAPY, AND PHOTOTHERAPY.** By Dr. WILHELM WINTERMITZ, Professor of Clinical Medicine in the University of Vienna; Director of the General Polyclinic of Vienna; Assisted by Dr. ALOIS STRASSER and Dr. B. BUXTBAUM; and BALNEOLOGY and BROMOTHERAPY, by Dr. E. HEINRICH KISCH, Professor of the University of Prague; Physician at Marienbad Spa; translated by AUGUSTUS A. ESCHER, M. D., Professor of Clinical Medicine in the Philadelphia Polyclinic, etc., and with notes on American Springs by GUY HINDALE, A. M., M. D. Special chapters on the Classification of Mineral Waters and their Distribution in the United States, by A. C. PEAL, M. D.; on the Practice of Phototherapy and Thermotherapy, by J. H. KELLOGG, M. D., and on Saline Irrigation and Infusions, by HARVEY CUSHING, M. D. Also an Appendix by the Editor. Illustrated. Published by P. Blakiston's Sons & Co., 1012 Walnut Street, Philadelphia.

The idea of this valuable contribution as a whole appeals to the practitioner who has had experience in the use of drugs long enough to find how often he must turn to natural methods to relieve his chronic cases. The editor deserves great credit for the conception of a scheme to publish a series which would cover the whole field outside of drug-giving, and the excellent character of the literary matter which he has brought together. He has set a pace for the profession which is both practical and progressive, and certain to lead up to a more rational therapeutics. The general character of the series is excellent and the last volume is an especially valuable one.

The subject of hydrotherapy is scientifically treated and ac-

companied with a large number of cuts which graphically illustrate the methods and modern apparatus, both German and American. One of the oldest therapeutic measures, it is but meagerly understood by the modern practitioner. The uses and source of mineral waters, foreign and domestic, will here be studied with profit.

Phototherapy can be studied from the pen of Dr. Kellogg, who has treated the subject from a large and practical experience, second to none in this country. The methods of Dr. Finsen are graphically illustrated and described.

In the treatment of the subject of thermotherapy the author has given, perhaps, as much as the space would permit, but has not exhausted the subject, as very much could be added on the therapeutics of this justly popular measure.

The editor's appendix is very instructive, including numerous ingenious and practical methods for the employment of water, heat, cold, light, and mineral baths.

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## NOTES AND COMMENTS.

The American Electro-Therapeutic Association will hold their annual meeting at the Hotel Kaaterskill, Catskill Mountains, New York, on the 2d, 3d, and 4th of September, 1902. Local excursions, concerts, balls, banquet, special parlor entertainments. Reduced rates to members, their families, and friends.

Preliminary Programme: September 1.

September 1. Special boat leaves at foot of Christopher Street, Catskill Line Pier, at 7 A. M., or after the arrival of the Fall River Boat.

Catskill to Palenville, per Catskill Mountain R. R.

Palenville to Mountain House by Otis Elevating R. R. Stages to Kaaterskill Hotel. Return during the week by same route.

September 2, Tuesday, first day: 8 o'clock A. M., breakfast; 9, executive meeting; 10, scientific sessions; 1 o'clock P. M., dinner; 2, excursion per mountain wagon; 4, afternoon session; 9.30, parlor entertainment and concert.

September 3, Wednesday, second day: 8 o'clock A. M., breakfast; 9, morning session; 1 o'clock P. M., dinner; 2, afternoon session; 7, banquet; 9, hop.

September 4, Thursday, third day: 8 o'clock A. M., breakfast; 9, morning session; 1 o'clock P. M., dinner.

Excursion tickets are \$3.00 for round trip, may be bought either at the Pier or on board the boat. Meals and State rooms extra.

Wescott's Express checks from house to Kaaterskill, on presentation of tickets without extra charge.

Members of the American Electro-Therapeutic Association can avail themselves of the special rate given by the hotel during this time.

For particulars write to Dr. Robert Newman, 101 West Eightieth Street, Chairman of Executive Council, or Dr. William Stevens, 70 West Fifty-second Street, Secretary Committee of Arrangements.

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At a meeting of the American Congress of Tuberculosis held in New York, June 3, 4, and 5, a reorganization was effected and the following officers elected for the ensuing year:

Honorary President, Dr. Henry D. Holton, Brattleboro, Vt.; president, Dr. Daniel Lewis, New York, N. Y.; first vice president, Dr. J. A. Egan, Illinois; second vice president, Dr. Frank Paschal, San Antonio, Tex.; third vice president, Dr. E. J. Barrack, Toronto, Canada; fourth vice president, Dr. J. A. Watson, Concord, N. H.; fifth vice president, Dr. Romola, Guatemala; secretary, Dr. George Brown, Atlanta, Ga.; treasurer, Dr. P. H. Bryce, Toronto, Canada.

The suggestion to hold a World's Congress of Tuberculosis in St. Louis in 1904 met with approval, and steps are being taken to advertise this fact and secure the aid of the medical profession.

The secretary is making an energetic effort to bring about the meeting of such a Congress, in which he should receive the co-operation of the profession at large.

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The twenty-first annual meeting of the New York Electrical Society was held at the Café Boulevard, Second Avenue and Tenth Street, Thursday June, 12, at 9 P. M. It was preceded by an informal banquet at 6.45, followed by music. The occasion was a most enjoyable affair, and reflects much credit upon the executive committee which had the matter in charge.

The following officers were elected for the ensuing year:

President, Dr. Samuel Sheidon; vice presidents, H. A. Lardner, G. Herbert Condict, H. V. A. Parsell, Hobart D. Betts, W. I. Donshea, and W. S. Barstow; secretary, George H. Guy; treasurer, H. A. Sinclair.

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The American Roentgen Ray Society desires to announce that its next meeting will be held in the city of Chicago on December 10 and 11 of the current year. There has been secured a most excellent local committee of arrangements, composed of well known and leading men of Chicago under the chairmanship of Dr. Ralph R. Campbell. This committee further embraces the names of Drs. John B. Murphy, Louis E. Schmid, M. L. Harris, W. L. Baum, H. G. Anthony, and W. A. Pusey.

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## SOME USES OF THE X-RAY OTHER THAN DIAGNOSTIC.\*

BY CHARLES R. DICKSON, M. D., TORONTO.

Electro-Therapist to Toronto General Hospital, Hospital for Sick Children,  
and St. Michael's Hospital.

That the X-ray has again come to the fore very prominently is evidenced in many ways.

Medical journals supposed to be quite conservative in their views are devoting much space to a consideration of the ray and its actions; the lay press, the manufacturers of apparatus, and the writers of books have not let the opportunity pass unheeded, and that the medical profession is thoroughly in touch with recent advances I can bear cheerful witness from the fact that I am very frequently asked to express an opinion as to the possibilities or probabilities of radiotherapy in many morbid conditions, usually of a class considered rather hopeless.

Under these circumstances, when your committee did me the honor of asking me to make a few remarks upon the non-diagnostic uses of the X-ray I very willingly acquiesced in its desire.

When the medical world was first startled with the marvelous accounts of this somewhat unknown quantity, so well-named the X-ray, the number of those who hastened to avail themselves of its wondrous diagnostic possibilities was legion, and as a large proportion of these were thoroughly unqualified to employ such a mysterious and dangerous agency, many very unfortunate incidents were duly chronicled, and as a consequence a reaction set in and the X-ray quite naturally fell rather into disrepute. But in time the ray came to be diligently and intelligently studied and better known by those

\* Read at twenty-second annual meeting of Ontario Medical Association, Toronto, June 4 and 5, 1902.

capable of using it properly, apparatus was perfected and technique improved, and we heard less of X-ray burns and more about the true value of the ray, and to-day it is more popular than ever, and who dare predict its future?

In view of this renaissance of the X-ray, and taking into consideration all that has happened in the past, it may not be altogether amiss just here to sound a note of warning against the indiscriminate and unskillful use of such a powerful agent, especially in the hands of those totally unacquainted with the subject of electricity in general and X-radiance in particular, for failure, disappointment, constant expense, not to mention actual and serious injury, will most surely beset their unhappy paths. As has well been remarked, "The X-ray is evidently a giant in chains; he must be careful who unchains it."

I will not attempt to detail all the conditions for which the services of the X-ray are now invoked, but shall content myself in dealing merely with some of the more important uses to which it is put where it has proved of value in authenticated cases recorded by reliable authorities.

The X-ray as a therapeutic measure is still on trial, much remains to be known as to the range of its usefulness, and medical opinion is still far from unanimous as to the necessary technique to be employed in those cases in which it has been found suitable. But, after making all due allowances, it may safely be stated that the X-ray has clearly demonstrated its great value, not only as a mere palliative, but as a curative agent.

Into the many curious, ingenious, and often far-fetched theories of the curative action of the ray I do not propose to enter in this paper. Much has already been written upon this burning question, and much more will yet be written ere a satisfactory conclusion is reached. But the fact remains that the X-ray is curative when properly applied in suitable cases. Much depends upon the apparatus employed, but much more upon the operator.

If you will permit me to recount some of the effects produced by the X-ray you will more readily see where it may be expected to be of service. One of the best known of these effects is the characteristic X-ray burn, and it is frequently stated that the ability of a tube to produce a burn is the measure of its curative power, and that the question of treatment

is simply a question of burning to a greater or less extent. But this is an erroneous idea. The production of dermatitis is not only unnecessary, but also most undesirable, and it can usually be prevented.

At the last meeting of the British Medical Association a member (Dr. Stopford Taylor) in discussing the question of effects drew the following conclusions from the actions of X-rays on *lupus vulgaris*:

"1. Rays applied to a moist surface lessened the discharge and changed it from a serous to a purulent character.

"2. That normal epithelium developed very rapidly and healing very quickly followed.

"3. That when applied to dry surfaces exfoliation of the epidermis took place and the part exhibited a dried and shrunken appearance.

"4. That absorption of morbid products took place, resulting in a smooth, soft, and pliant scar.

"5. That an erythema of uncertain duration, depending not altogether upon the length of exposure or its strength, always accompanied these changes, and that, unless this was permitted to disappear between each successive application of the rays, an aggravation of the disease occurred." He regarded X-rays as a stimulant. (Quoted from *JOURNAL OF ADVANCED THERAPEUTICS*.)

Dr. William J. Morton, in an article in the *Medical Record* on "Treatment of Malignant Growths by the X-ray," under Conclusions says: "What is accomplished by the X-ray? 1. Relief from excruciating pain and constant suffering, often immediately. 2. Reduction in the size of the new growth. 3. Establishment of the process of repair. 4. Removal of the odor, if present. 5. Cessation of the discharge. 6. Softening and disappearance of lymphatic nodes. 7. Disappearance even of lymphatic enlargements not directly submitted to treatment ~~and often quite distant~~. 8. Removal of the cachetic color and appearance of the skin. 9. Improvement in the general health. 10. Cure, up to date, of a certain number of malignant growths," (abstracted by *JOURNAL OF ADVANCED THERAPEUTICS*).

From these quotations, which my own observations confirm, may be inferred the wide range of conditions which ought to be benefited by radiotherapy.

A rapid glance at some of these must suffice, and quite naturally our attention turns to the skin. The well-known and early-observed fact that the X-ray causes partial atrophy of some of the appendages of the skin is utilized in producing depilation where such should be thorough, *e. g.*, preliminary to the treatment of sycosis. In view of its other effects, it is almost unnecessary to remind you that the X-ray is a parasiticide and hence is of value in the parasitic diseases of the skin, while its power to stimulate tissues and cause absorption is utilized in the treatment of chronic inflammatory affections, such as indurated patches. It has hence been used with success in tinea tonsurans, favus, sycosis, eczema, acne rosacea, acne vulgaris, prurigo, ano-vulvar pruritis, nævus vasculosus, rodent ulcer, ulcers following burns, psoriasis, scrofuloderma, lupus vulgaris, lupus erythematosus; its action in causing the destruction of tissue of low vitality is also of great service in the treatment of epithelioma, *e. g.*, of eyelid or cheek.

But the action of the X-ray is by no means confined to the surface; carcinoma of the stomach, and of the *cervix uteri*, and many cases of sarcoma have been most favorably reported upon, and many inoperable cases of malignant disease, and also tuberculous joints.

The X-ray has also proved of service in conjunction with the Finsen and other light treatment and in situations where that light could not well be applied, such as the otherwise inaccessible nasal and oral cavities.

I have made use of its marked analgesic action in a case of neurasthenia with marked dyspeptic symptoms consisting of great discomfort in the epigastric region, interfering greatly with sleep. Under the influence of the X-ray directed over the solar plexus the patient fell asleep during the treatment, and on returning to his home went to bed at once, and slept soundly through the whole night, a thing which he had not done for many months.

These are only some of the uses of the X-ray, and by no means are they all that could be recounted. But there is yet another use and one of great importance, viz., the directing of the attention of the medical profession, even at this late date, to the possibilities of static electricity as a remedial agent. Many of those who are now using the X-ray are energizing their tubes by means of the static machine, and will not limit

it to such use, but will be led to investigations which will amply reward them for any attention directed thereto.

Among the cases at present under my treatment by the X-radiance are lupus, epithelioma of tongue twice excised, lymphadenoma, scleroderma, goiter, nævus vasculosis.

The case of lupus, well illustrating the progress of treatment, has kindly consented to appear before you. The case is of twelve years' duration and has undergone about all the classical treatment in vogue to date, without avail.

He has been under X-ray treatment since February 19, 1902, and has received thirty-eight such treatments.

I cannot more fittingly bring this fragmentary paper to a close than by quoting again from a recent article by a man already referred to, who has done more than any other one man to popularize—in its best sense—the use of the X-ray, diagnostic and therapeutic, Dr. Wm. J. Morton of New York.

The article is abstracted in the last issue of the Philadelphia Medical Journal from Medical Record: "He concludes as follows: 1. Radiotherapy broadens our conception of the possibilities of the therapeutics of modern medical science. 2. The X-ray has a general application for the relief of pain. 3. As to technique, a standardization as to the apparatus and its capacity, as to duration and frequency of treatments and distances of the tube, is recommended to operators. 4. The X-ray has a curative effect in internal cancer and other internal diseases. 5. For superficial disease a medium soft tube may be used, for internal cases a hard tube. The hard tube is applicable, however, in all cases. 6. X-radiation is recommended prior to any operation, to clear the tissue of cancer particles and foci, and to circumscribe the disease. 7. X-radiation is recommended after operation to preclude a recurrence. 8. X-radiation may be recommended in place of an operation, and may be preferable to one for the reason that operation secures but a comparatively moderate percentage of permanent recoveries, and because up to date X-ray procedure shows a continued improvement in cases, and a percentage of cures which will, undoubtedly, compare favorably with surgical operation. 9. There is danger to the patient or uncertainty as to what might be accomplished when the X-ray is employed by immature operators. 10. In X-radiation we possess more nearly a solution of the problem of curing cancer than by any other method of treatment."

## AN APPARATUS FOR LOCALIZING THE X-RAY TO THE CAVITIES OF THE BODY.

BY MARGARET A. CLEAVES, M. D., NEW YORK.

In the treatment of malignant conditions in the interior of the body by means of the X-ray the physician has been handicapped by his inability to localize the energy directly at the site of disease. In cases of intra-abdominal or intra-thoracic cancer it has been necessary to make the application to the external surface of the body, and to depend upon the penetrability of the X-light radiations to influence the unstable molecules and compounds characteristic of malignant growths and which are influenced over and above normal tissue, even though at a greater depth than the latter. It has been the writer's privilege to use for therapeutic applications the new apparatus devised by E. W. Caldwell, B. S., and described in the N. Y. Medical Journal, July 12, 1902, for the treatment of the larynx, tongue, rectum, prostate, cervix uteri, vagina, etc., in the treatment of an inoperable cancer of the cervix uteri, vaginal walls, and broad ligaments.

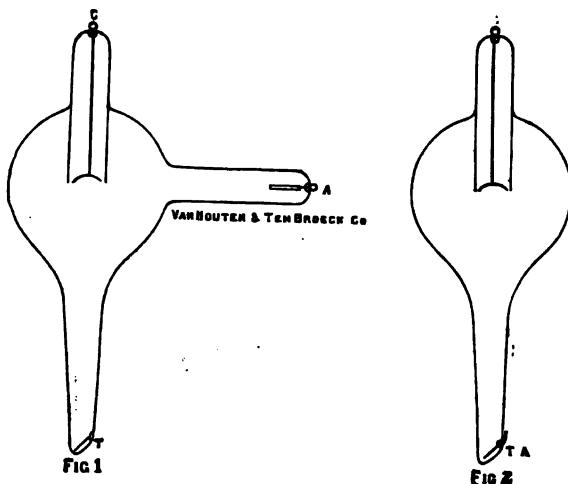
While the improvement made in this particular case was established by the use of an ordinary X-ray tube, used in connection with the usual bivalve speculum, and supplemented by the use of the arc light as heretofore described, yet this apparatus of Caldwell's offers advantages over and above the ordinary tube which cannot fail to make it a means *par excellence* of applying the energy of the X-ray directly to the seat of disease.

The accompanying cuts show two forms of the tube. In these tubes the target is placed, not within the spherical part, as usual, but at the end of a tubular prolongation which extends nearly to the center of the spherical part.

In Fig. 1 the target is completely insulated, and the anode, *a*, is placed at the end of a third tubular projection from the spherical part. The tube shown at Fig. 2 is similar in appearance to the first one, but the target is provided with a connecting wire extending through the glass, and may therefore be made the anode. With this form of the tube it is desirable to use the shield and handle shown at Fig. 3.

This shield is a tubular hood of sheet metal, which slips

over the projection carrying the target, and performs the following important functions: protecting the glass from breakage, containing an aperture for the passage of the X-rays and therefore limiting the area exposed to their action, and, by making contact with the connecting wire of the target, completing electrical connection between the target and the handle. The metal handle (see Fig. 3) also supports the shield



and the tube, and is provided with a switch so placed that it can be operated by the thumb, in order to ground the negative wire, thus short-circuiting the tube, stopping the X-ray, and making it possible to handle both wires even while the exciting apparatus is in operation. With both tubes, Fig. 1 and Fig. 2, the positive terminal of the exciting machine is grounded. The tubular projection carrying the anode may be used as a handle, without shock being felt either by the operator or the patient, when the machine is in operation.

The tube shown in Fig. 1 may be used without any special device for holding it; the tubular projection carrying the target can be readily introduced through any of the common forms of rectal and vaginal specula, and thus applied to the vagina, cervix uteri, rectum, or through the rectal walls to the prostate. It could also be inserted through an artificial sinus in the abdominal wall in advanced malignant growths of the viscera.

The flattening of the glass enables the target to be brought very close to the part to be treated, and in the throat it may be brought very close to the soft palate, *i. e.*, about in the same position occupied by a laryngoscopic mirror. In this position the rays will fall directly on every part that can be seen by the mirror. If a strong exciting current be used the target ends of the tubes very readily become hot. With them the source of the X-ray, however, is brought five or ten times closer to the part to be treated than is possible with the ordinary X-ray

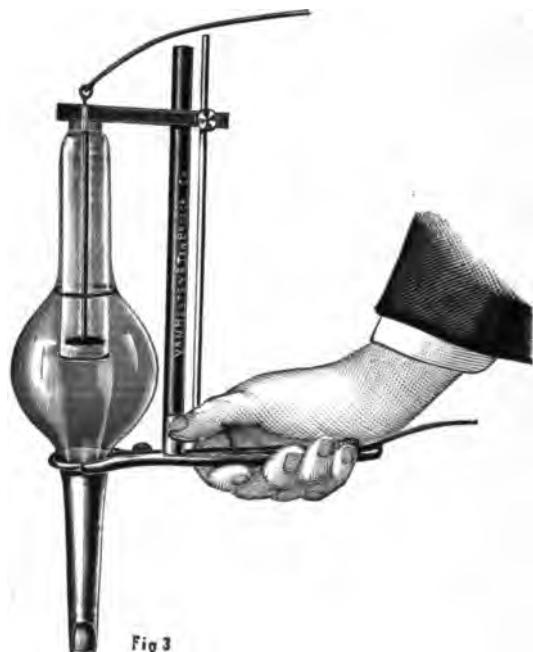


Fig. 3

tube. As the effect of the rays decreases approximately as the square of the distance from their source, these tubes, with a given excitation, should have about 25 to 100 times the effect of an ordinary tube. It is not necessary, therefore, to use a strong exciting current, or to make a long exposure. In the event of using an induction coil as a source of excitation, a series spark-gap of one or two inches should be included in the circuit in order to prevent short-circuiting the secondary windings of the coil when the tube is short-circuited by the handle.

Caldwell believes the static machine to be better adapted for exciting these tubes, because it produces less heat from a given amount of the X-ray than an induction coil. A small machine is the best. The writer has used them, however, with a 12-plate machine, and from 3-4 to one inch spark-gap. Grounding the positive prime conductor, while an advantage in the ways pointed out, may, by an increase of the electrical capacity, assist in the production of a burn, not X-ray, but from the contact of the metal shield with the tissues.

Following the first application made with this apparatus the writer had such a burn on the cervix uteri, not an X-ray burn, but where the metal end of the shield touched the cervix uteri, and where the part was completely shielded from the X-ray. It healed in a few days. For this reason the tube shown in Fig. 1 may have advantages over and above the other. This must be proven. There is no doubt, however, of the very great value of Caldwell's apparatus for the application of the X-ray to internal organs over and above the ordinary method. The energy is sufficient by the nearness of approach to secure results without a strong exciting current and with a short exposure. With a small machine the current density would not be sufficient to produce an escharotic action on the tissues with which the shield comes in contact.

It is hoped that experimental work now going on will result in securing a device so well inculcated as to avoid grounding the positive terminal. The writer has made exposures of from one to five minutes in length, and with present experience is disposed to regard a three-minute exposure as sufficient.



## SOME PRACTICAL POINTS ABOUT THE STATIC MACHINE.

BY G. F. HANSON, M. D., PH. G.,

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of San Francisco, Cal.

The trials of the incipient operator are not few. Our experience, out here in "the wild and wooly," may be of some interest.

Our apparatus is that of a reliable New York house, selected at headquarters. We have no special fault to find with it, but experience leads us to suggest ceratin minor mechanical, but major trouble-saving, improvements in that as well as other makes.

During our first month's use of the static we were almost daily phoning desperately to the agency, for someone to come over and charge the machine. Generally an inexperienced boy was sent, and the poor lad expended as much energy in turning the little crank of the Wimshurst by hand as did Dickens' Mantilini at the mangle. So much time was required to charge the machine day after day that we were disposed to agree with the mantle-maker's husband, that it was all one "demnition grind," and that it seemed as if everything were going to "the demnition bow-wows." All the machines from various manufacturers that I have seen have that "dinky" little hand-crank for charging the Wimshurst.

It soon got very monotonous; so we bought a "two-step" (double) pulley wheel, put it in the place of the single pulley on our one-sixth horse-power motor; took the crank off the left side of our Wimshurst and changed it over to the right side, replacing the crank handle by a pulley wheel four inches in diameter, and lastly connected the Wimshurst with the motor by a short belt in the same way as the Holtz. Then we turned on the power and grinned. No more elbow-grease, perspiration, and profanity. We could speed our Wimshurst "to the queen's taste," simply throwing off the belt with the finger when the Holtz was charged.

The commercial calcium chloride we were using for keeping the interior of the case dry proved very unsatisfactory. The

uninviting-looking masses (which suggested "chunks of fat pork" to one patient) turned brown and became "mushy" on the surface, giving off at the same time an unpleasant odor and failing to abstract the moisture thoroughly in bad weather. We replaced it with Merck's crude granulated calcium chloride, a one-pound bottle being sufficient for both compartments of the case, and have had no trouble since.

We had previously tried the introduction of hot air from below through a hole bored in the bottom of the Holtz compartment (with a vent in the top), but without success. Our experiment had merely resulted in driving so much moisture on to the glass plates that it stood on them in drops, and so spotted them that they had to be re-varnished. For this purpose we used the French spirit varnish, which, however, is probably not so good as the special "plate varnish" recommended.

To make assurance doubly sure we placed a 32-candle power incandescent in each corner of the Holtz compartment, connected with a common switch-button attached beneath the rheostat. Should the machine appear a little slow in taking up its charge from the Wimshurst, we turn on the lights and start a warm current of air to circulating in the Holtz, thus enabling the granulated calcium chloride to more quickly abstract the moisture. The lights serve, too, to brightly illumine the room in emergencies arising during the use of the X-ray, without having to light gas or raise curtains.

Meantime the noise from the vibration of the case and frequent scratching of loose plates in the Holtz jarred on our sensibilities. Our neighbors in adjoining offices must have uttered dire maledictions when we ran at any considerable speed. Level up the machine and tighten up the disks as we might, the noise developed would have done credit to a small boiler foundry.

Fortunately we numbered among our acquaintances a couple of first-class mechanics in charge of departments in the largest iron works of the West. We told them our troubles and they investigated; with the result that after a little time they turned out for us a set of six-inch disks of red vulcanized fiber to replace the four-inch black disks originally provided for holding the revolving glass 30-inch plates. Those solved the problem. The increased diameter of the disks held the

plates firmly, and there has been no scratching since. Finally, we put a firm soft-rubber disk four inches in diameter and an inch in thickness, on the floor under each leg of the case, and silence now reigns in staticville. The machine has sometimes been left running at a moderate speed, and entirely forgotten because of its noiselessness.

Occasionally an electrician will tell us that static machines have much the same "individuality" as claimed by some old railroad engineers for their locomotives. In the latter case this idea may have originated in the gregarious instinct of the animal, man, leading through years of association in the lonely cab to a certain pseudo-affection for the iron horse guided by the engine-driver over paths of steel throughout the weary vigils of the night. In the case of the static the romance is eliminated by the realization that most of the "crankiness" is due to mechanical deficiencies, which it is hoped will be corrected in the more perfect output of the future.

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CHRONIC INFLAMMATION OF THE UTERINE APPENDAGES: ITS TREATMENT BY MERCURIC CATAPHORESIS.\*

BY G. BETTON MASSEY, M. D., PHILADELPHIA.

There are two classes of cases that tax the patience of the general practitioner to an extreme limit, and too often result in intervention that is ever afterwards regretted by the patient. I allude to instances of catarrhal inflammation of the fallopian tubes in young women, usually monolateral, with more or less involvement of the ovary, as one class. The other class consists of chronic invalids who have at some previous time suffered from an acute attack of pelvic peritonitis, and in whom a physical examination reveals a firm agglutination of the peritoneal surfaces of the pelvic organs, together with the muco-purulent discharge from the upper genital tract.

The clinical history of both classes of cases shows that they are aetiologically identical, with an important difference in their present condition; the second class representing the first after an acute attack caused by more or less traumatism, or other agency, has been superadded.

The nature of the affection in both cases remains, however, the same, for we have essentially a mere inflammation to combat, and in the chronic stages to which I refer exclusively the major portion of the affection remains centered in the mucous membrane of the tubal tract, the serous surfaces being merely agglutinated.

The question of what shall be done for these semi-invalids is one of much moment. I restrict consideration to the semi-invalids, for in the presence of the indications of a closed abscess cavity in any portion of the pelvis, evidenced by the occurrence of a slightly elevated temperature, the case is regarded as amenable only, and properly, to one of the several surgical procedures so well known to you.

That vaginal applications of electricity will relieve and secure a practical cure of many of these inflammatory sequels, often after hot-water and counter-irritant swabbings have failed, is well known to the writer and to many other physicians,

\* Read before the Section on Obstetrics and Diseases of Women, Amer. Med. Assoc., at Saratoga, June 12, 1902.

but the treatment has the disadvantage of tediousness, for the remedy cannot be applied in force to the diseased spots, but only indirectly through the vaginal wall. This remedy has, moreover, been neglected in these conditions by those expert in its use by reason of misinterpretation of a dictum of Apostoli, who advised most properly against all intra-uterine applications of electricity in the presence of tubal or ovarian inflammation. An equal contra-indication to all other intra-uterine medication exists, of course.

It will be observed that these statements leave the way clear to vagino-abdominal applications of electricity in all peri-uterine chronic inflammations, provided the purulent or muco-purulent discharge possesses a drainage outlet. It is to an improvement in this vagino-abdominal application of the galvanic current that I wish to call attention, in which the electric current is made to carry a microbicide that, by repeated interstitial diffusions, may reach and sterilize the germs of inflammation within the tube without detriment to the intervening vaginal wall, and that will at the same time assist phagocytosis by tissue stimulation. The agent selected is the electrolytic salts of mercury, manufactured and diffused simultaneously by the current by simply coating a metal positive electrode with quicksilver and pressing the instrument against the vaginal wall nearest the diseased structures. The circuit is, of course, completed by the usual abdominal pad, and the electrode, which may be of brass,\* should be large enough to avoid undue irritation of the vaginal mucous membrane.

The profound local effect of these procedures, when repeated daily, or tri-weekly, for six or eight weeks, is instanced, not only in a recession in the symptoms and improvement in the physical conditions, but also in a singular effect on the ovarian functions. By the second month the patient will notice a diminution, or even suppression, of the menstrual flow. This phenomenon has been so regularly observed in the patients treated as to be significant. Its probable explanation is a deterrent action on ovulation. As the applications proceed, nevertheless, nature reasserts herself and normal periods appear as

\* Recent experience indicates that the vaginal electrodes produce a more powerful local action if it is made of zinc—coated, of course, with mercury.

usual, though somewhat scant during the further continuance of the applications.

Concerning the details of these applications I should say that the active electrode is always positive, of course, as it is from this pole that the electrolyzed mercury is diffused as an oxychloride, united with the oxygen and chlorine of the tissues. When the mercury is used on a brass surface some of the brass metals are diffused, but very little indeed, the electrode often emerging from the application quite denuded of the mercury. About 60 millamperes for five minutes, daily or tri-weekly, may be used with a large olive-shaped electrode, without undue vaginal irritation.

**CASE I.**—The details of this case were given in the JOURNAL OF ADVANCED THERAPEUTICS for January, 1902. Briefly, it was that of a young married woman, who was about to have an operation for the removal of a boggy tumor in the left ovarian region that was the seat of constant pain. A similar tumor had been removed from the other side by abdominal section six years before. Her general condition had not been improved by the previous operation; the patient, in fact, claimed that she had been made worse by it. After six months, somewhat interrupted, treatment, the tumor decreased and finally disappeared, coincident with a complete restoration of her general health. The pelvic functions in particular were restored to a healthy condition that the patient never enjoyed before, her early history having been menorrhagic. During the progress of this case several sudden flows of watery leucorrhœa were noted, making it probable that the tumor was at least partly tubal.

**CASE II.**—A young lady, with constant pain in the left tubal region, was first seen June 19, 1901. The pain was stated by her to have followed a curettage and pessary wearing, the former operation having been done by a skillful gynecologist two years before. The affected region was boggy and tender to the touch, and she suffered from a very profuse and purulent leucorrhœa.

Under the treatment described the tenderness and tumefaction slowly lessened, and though the leucorrhœa had not entirely ceased at last accounts, it is evident that the possibility of an unsexing operation was entirely banished from her life.

**CASE III.**—Miss E., aged thirty-five, with a history of leu-

corrhea and menorrhagia previous to the removal of the left ovary, two years before I saw her, came under observation September, 1901, saying she had as much menstrual pain, intermenstrual pain, backache, and local tenderness in the left ovarian region as before the removal of the ovary. The leucorrhœa was especially abundant. She improved steadily under the treatment described, and is now in excellent health.

During the progress of each of these cases there were several missed periods, and in the last case one disheartening return of menstrual pain, though she was able to pursue with ease her occupation of dressmaker, including prolonged use of the sewing machine.

CASE IV.—A married lady, thirty-one years of age, has been a semi-invalid for six years, at which time she had an attack of salpingitis and pelvic peritonitis that left the pelvic organs firmly adherent. Tumefaction existed in both ovarian regions. Constant pain was complained of in the left ovarian region, and there was a copious purulent discharge from the uterus.

During the treatment of this case several periods were passed without flow, though the symptomatic improvement pursued the usual course. The final result was a symptomatic cure, examination showing also that the organs were more mobile and tumefaction lessened.



## VARICOCELE.

BY ROBERT NEWMAN, M. D., NEW YORK.

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Varicocele consists of a varicose dilatation of the pampiniform plexus, particularly of the veins of the spermatic cord, and often, as a consequence, of a similar condition of the veins of the scrotum.

**Anatomy.**—The spermatic veins leave the back part of the testes, and receiving branches from the epididymis, unite to form the pampiniform plexus; then pass up in front of the vas deferens and unite to form a single trunk, which terminates on the right side in the inferior vena cava, direct. The circulation on the left side is not direct, going first in an acute angle into the left venal vein, which empties then into the inferior vena cava. This anatomical relation and the pressure of the contents of the sigmoid flexure explain the more frequent occurrence of varicocele on the left side, while the disease is comparatively rare on the right side.

The scrotum has a different direct supply of blood. From the femoral artery the scrotum receives branches from the superficial and deep external pudic, and from the superficial perineal. From the anterior trunk of the internal iliac another supply is added by the coroneal branch of the internal pudic, and by the cremasteric branch of the deep epigastric.

The spermatic supplies the testicles and cord, while the superior vesical goes to the vas deferens. From this anatomical condition it seems that the spermatic cord and the scrotum are supplied by different arteries, but anastomosis must be present in pathological conditions, as practically continued dilatation affects the neighboring parts.

**Etiology.**—The ætiology of varicocele is an engorgement or a varicose condition of the veins, a mechanical obstruction to the return of blood from whatever cause; a relaxed state of the coats of the vessels themselves, and a quasi paralysis of the valves in the veins. There may be different causes, mostly arising from irregular sexual relations. In the healthy con-

dition the veins, as well as the arteries, are straight and free from all twisting.

Symptomatology.—Pain may be present, but often is absent. Sometimes an aggravated varicocele causes no pain. Neuralgia may occur in the testes, extending up the back and down the thighs. The vessels are elongated, the walls atrophied and thickened, and the shape of the part is pyriform. The scrotal veins are next affected in such a manner that the enlargement can be distinctly seen by the blue color. To the touch it feels like a bunch of earthworms. The testicle is generally soft, wasted, and wormy; gradually atrophies, and is often entirely destroyed, which may be followed by functional impotence. The most distressing symptom is the impression of the mind, which shows itself in a marked state of hypochondria.

Diagnosis of varicocele is made easy by ocular inspection and touch, by manipulation while the patient lies in a recumbent position. The only discrimination as to exclusion must be made of omental hernia, which will be reduced by manipulation, while the patient lies in a recumbent position. If the fingers are placed at the abdominal ring and the patient stands up a hernia will be retained, while the varicocele will return; the vessels filling from below upwards. A complication of a hernia or hydrocele is possible.

Care is necessary in making this differentiation, as an omental hernia may be un reducible.

The prognosis is mostly uncertain, as a general rule.

Treatment may be divided into many subdivisions, which are palliative and even may cure:

1. Support and compression by mechanical means.
2. Electricity.
3. Surgical operations.

Surgical operations may be successful, but failures are often the issue, and they may end fatally, by pyæmia, thrombosis, embolism, or general sepsis. Other operations may not cure and relapse follows, which upsets the patient's mind entirely. Dr. Delpech was assassinated by an ungrateful, crazy patient.

The following operations have been practiced: Ligation in different ways; division of veins, by Brodic; excision; figure-of-8 pressure over a pin beneath the veins; fistula tourniquet of Luke; injection of subsulphate of iron; excision of the

lower part of the scrotum, using an external clamp; division of the veins by galvano-caustic; galvano-puncture with needles; and others. All are subject to objection and failures. It is admitted that all the operations mentioned may sometimes succeed, but each of them has often failed. An operation once in vogue was the cutting off of the redundant scrotum, after a clamp had been tightly applied. The tissues were removed along the clamp with a bistoury and the parts brought together by interrupted sutures, and all bleeding vessels ligated. Adhesive strips and a compress completed the dressing. Even this operation had its drawbacks, possibly followed by erysipelas and sloughing, and the question arose if the smaller scrotum would not be very uncomfortable if inflammation of the other neighboring organs occur later.

With most of these operations the writer is familiar, having practiced some, and seen others performed, or he assisted friends.

While chief of the surgical clinic of the Long Island Hospital Medical College it was our habit to ligate the veins mostly with silver wire, cut the ends of the wire and drop it back into the scrotum. The patients came to the clinic, were operated upon, and immediately went home or continued to work. The results were unaccountably successful, and an untoward symptom was never reported. Soon after the writer had an important case of varicocele in a private patient. All possible care was taken; my professor of surgery, Dr. Jos. C. Hutchison, assisted, in fact, performed the operation in his best style, after the patient had been etherized. The result was a complete failure; the wire loosened, dropped, and acted like a piercing, painful spear. The consequence was losing the patient and all practice among his friends. This is another instance of the unreliability of the surgical operations in varicocele, and the only good luck was that we were not assassinated as Delpech was.

Many cases presenting themselves in the year 1885 in succession set me thinking of mechanical means to cure the varicocele. Support and a gradual, but firm, compression by stationary means were the indications, but many obstacles turned up in my experiments, of which a particular one was that the mechanics could not comprehend my intended appliances. After several interviews and explanatory exchanges at last the

late Mr. Pomeroy, an excellent man for making mechanical instruments, loomed up at once, and after a few trials made for my patients two forms of appliance for varicocele suspensories. (1) One was a firm capsule for the support of one side only. It consisted of a frame of hard rubber, beneath which was a copper wire netting of a certain gauge. This had to be made to measure, in order to fit exactly the side afflicted. It was retained to the part by a spring worn round the hip like a truss. (2) The other instrument was for an advanced stage of varicocele, in which either or both sides were affected, or at least a larger area of the scrotal veins. This instrument was more like a suspensory bag, the base consisting of the copper-wirework netting. The art in this work consisted in the election of the right number of wire, in the correct twisting of it, and making the interstitial spaces correct; as too large openings would strangulate parts of the scrotum, too small would be ineffective.

The object was to give such permanent support to the diseased parts that a gradual firm pressure compressed the dilated veins, facilitated the return of the venous blood, until the veins regained the anatomical power to make a normal circulation.

After a few trials and modifications of the appliance we had a complete success, and the patients were cured. Writer can distinctly recollect a succession of cases at a certain time, but will only give a few histories found in an old note book.

June, 1885. Varicocele, left. No. 2750, R. M. T. Has a progressive varicocele; the left testicle is almost destroyed to such a degree that no defined compact form can be found, and only a soft shapeless mass is left, much reduced in size and the scrotum is hanging down, far beneath the other testicle. The right testicle shows some inclination of the beginning of varicocele. Mr. Pomeroy fitted a truss.

June 20. Two weeks afterwards, in which the truss was worn, the varicocele virtually could not be found.

August. He wore the truss, changing it at times for a suspensory bag.

September 15. While traveling he wore a suspensory bag. Nevertheless the varicocele had disappeared. It was cured, and even the testicle was restored to a normal state in every way. This patient came for treatment of a bad stricture, which was cured by electrolysis.

1886. Came twice to New York to report that the cure had been permanent.

July, 1885. Varicocele, left. No. 2756, C. C. Patient was under treatment for syphilis, and a varicocele was found on the left side; a truss was fitted by Mr. Pomeroy and it gave no inconvenience. This varicocele could scarcely be traced any more after the instrument had been worn two weeks.

August. The truss was removed for a moment, and on examination the ailment appeared cured.

October. Varicocele has almost disappeared. Truss has been worn steadily, almost every day with comfort.

September, 1885. Traumatic stricture. Impotence. Varicocele. No. 2689, Q. G. A varicocele has advanced to such a degree that it caused functional impotence.

September 14. A truss was fitted by Mr. Pomeroy.

September 22. Truss is worn with comfort, the veins are smaller, so that the wormlike feeling on touch has disappeared.

October 23. Varicocele appears cured; he still wears the instrument, and when he removes it there is no trace left of the malady.

Other cases have been treated in similar ways and could be cited. All show that the treatment by compression, to induce the relief of the veins to a smaller caliber and thereby the return of the venous circulation, has been a success. This was the writer's treatment in 1885, which at the present time has been improved by using electricity in connection with the mechanical means. Different ways and currents have been used.

Dr. C. S. Neiswanger of Chicago uses the anode of a galvanic current, as the active pole, but applies the clamp at the same time to the dilated veins. This clamp has been somewhat modified from a rectangular to a semi-cylindrical form. Later the cataphorical action has been induced by applying to the parts the extract of the suprarenal capsule, with the intention that such should act as a powerful vaso-constrictor. Such a solution has been used in the proportion of one dram of the extract to two ounces of water, which appears to be very strong.

Another way of employing electricity is the use of a high-tension faradic current, which acts as a constrictor, and diminishes thereby the caliber of the veins. The anode is the active pole, and the cathode may be placed on the abdomen or on a

more remote part of the body. The action of this current is the same as in the application on a procidentia of the uterus, in which case the contractions are so great that the electricity diminishes the size of the part and carries the uterus back into its place through the vagina. The writer prefers this latter procedure with a Kidder high-tension battery and has had a few remarkable successes. Such séances should be made about four times weekly. Varicocele will be cured best by a combination of the mechanical pressure and the electricity as described.

Static electricity in the form of the Morton wave current to the spine is valuable as a general tonic, and may be given, in conjunction with hot air, once or twice daily for twenty or thirty minutes. It is credited by some observers with extremely good results in this disease when used alone, but I have never relied upon it to the exclusion of hot air.

**Drugs.**—The bowels should be kept freely open by the use of calomel and salines when any inclination towards constipation is evident, and digestive disturbances should be corrected, but, aside from this, drugs are very rarely necessary when hot air is being administered, and the less medicine the patient ingests the better, usually.



## THERAPEUTICS OF DRY HOT AIR.

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN,  
CONN.

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## CHAPTER XI.

## NEPHRITIS.

By this term is meant true Bright's disease and not the infectious inflammations of the kidneys. The ætiology of both the acute and the chronic forms is a subject as yet open to discussion, but the belief seems to be steadily growing that the renal pathology observed is due to the excretion by the kidneys of substances irritant to their functional structures which are abnormally present in the blood. The presence of these bodies in the circulation is probably due to imperfect metabolism somewhere in the economy by reason of which oxidation is incomplete; a condition, in short, somewhat similar primarily to that which constitutes the gouty diathesis. If this proves to be true, the disease will have to be transferred from the category of the renal to that of the constitutional disorders; an impairment of general metabolism, of which the changes in the kidneys are but the secondary local manifestations.

The way in which the disease responds to hot air strengthens this conception of its causation, as does also the fact that the only therapeusis that has ever been of value in the condition is that which has had elimination of some sort, or increase of oxidation in the body as its object. The clinical aspects of the disease are also indicative of systemic toxæmia of some sort. What constitutes the toxic agency we have yet to ascertain, but it is now pretty thoroughly established that it is not urea; probably some antecedent bodies. The effect of body hot-air treatments in all sorts of diseases is to increase the excretion of urea from fifteen to fifty per cent., according to determina-

tions made in my laboratory, the higher percentages coming almost without exception from the uræmic cases. This would indicate that its beneficial influence in this disease is due to a power by reason of which these antecedent bodies are oxidized into a form susceptible of normal and unirritating excretion.

When I first began to use hot air in 1898 I was supplied only with the local apparatus, but one of my early experiments was upon a case of chronic Bright's disease. I applied the agent locally over the kidneys in this and shortly after in a second case, but with entire failure, as far as beneficial results were concerned, in both instances. My next experience with the agent in this condition was accidental, and after I had been using the body apparatus for some months. A patient who had had chronic nephritis for many years was being treated for rheumatism. It was noticed after two or three days that the albumin in her urine was lessening, and about two weeks after her first body treatment it had entirely disappeared. It had not returned three months afterward, and during this period the patient felt perfectly well in every respect and exhibited absolutely no evidences of renal impairment. At the end of this time she removed to another city and I have not seen or heard of her since, hence do not know if the result was permanent in her case. This occurred in the spring of 1900.

As has been stated, body hot-air treatments rapidly lessen the quantity of albumin sometimes encountered in the urine of arthritis deformans, and the above incident, in connection with my observations of this fact, induced me to subject my renal cases to the influence of this element of therapeusis. The results were most gratifying.

As a rule asthma, cedema, nausea, headache, somnolence, etc., promptly disappear. The urine becomes sometimes entirely free from albumin and the quantity of this constituent is always markedly lessened. The patient is usually restored to usefulness and sometimes to apparently perfect health. The question of permanency is one which cannot as yet of course be passed upon as the cases have not been under observation long enough, but the transcendent value of body hot-air treatments, in relieving to a great extent the symptoms of renal insufficiency, has been established beyond cavil, and it now only remains to ascertain how long the relief will last. This may

prove to be a point of comparatively minor importance, however, as recurrences so far seem to yield to treatment as readily as the original attack, and repeated occurrences merely mean that the patient must take repeated courses of treatment. If the intervals between the courses were not unreasonably short, any victim of chronic Bright's disease would be only too glad to get out of his difficulty as easily as this.

I have not yet treated, and have not heard of anyone else having treated, a case of complete uræmic coma with hot air. It is reasonable to suppose, however, that it would act as efficiently in this condition as in the milder forms of intoxication, and if this proves to be true it will have forged another great claim upon our respect.

Treatment.—The local application of hot air never enters into the problem at all, and the technique of the body treatment is very simple. The majority of these cases are encountered in persons whose arteries have not yet taken on atherosomatous changes, hence particular care in this direction is not necessary. There is usually present, however, a high pulse tension, and during the first treatment the heat should be increased very slowly, watching this phenomenon meanwhile. It usually disappears during or immediately after the first séance. If no undue exhaustion follows the first treatment, and it is very rarely that it does, it may be repeated the following day, and thereafter every second or third day until the albuminuria and other symptoms have disappeared. The temperature of the first treatment should be at least 300° F. unless contra-indications obtain, and in those succeeding it may be pushed to 350° F., and run up as quickly as the patient's tolerance will permit, by which modification we secure a sudden strong impulse upon the nerve centers, which it is our aim to influence as profoundly as possible. The after-care of the patient is that usual to the body treatment.

The respiratory embarrassment, cardiac disturbances, œdema, headache, high pulse tension, and mental sluggishness are nearly always markedly relieved during the first treatment and sometimes before the patient leaves the apparatus, and it is not infrequent to see them disappear entirely within four hours.

Adjunctive Measures.—The diet should always be cut down to milk and milk only, if possible, until the toxæmia has been

gotten thoroughly under control, and should then be regulated as is usual in these cases. The more water the patient drinks the better, and it will not increase the dropsy, under these conditions, as is sometimes supposed.

R. W. Corwin in the Denver Medical Times for June, 1901, reports one case of Bright's disease with partial paralysis of the right leg following uræmia, in which the uræmic symptoms disappeared "quickly, after three baths had been given, and the patient recovered full use of paralyzed muscles," and an acute case following variola, with great oedema of the subcutaneous tissues and fluid in the abdominal and pleural cavities, which recovered completely in less than four weeks. These are the only cases, aside from my own, that I have seen reported.

The advantages exclusively dependent upon the application of hot air in the treatment of this disease are as follows:

First, rapid relief of the dropsy, respiratory and cardiac embarrassment, frequently within four hours.

Second, the accomplishment of this result without the aid of, and more efficiently than is possible with, drugs; hence avoidance of the deleterious after-effects not infrequently dependent upon the use of the latter.

Third, the marked lessening of the general toxæmia and of the quantity of albumin in the urine, together with the increase in the quantity of urea excreted, affords ground for the belief that a certain amount of correction of the faulty metabolism which it is probable constitutes the main ætiological factor in the production of the clinical phenomena of the disease, is also effected by body hot-air treatments. For a decisive verdict upon this point, however, it will be necessary to wait a little longer, and observe whether or not, and how, exacerbations after treatment enter the problem in the future.

## Editorial.

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### RECOGNITION OF THE X-RAY IN THE TREATMENT OF MALIGNANT DISEASES.

A DVERSE criticism of the employment of the X-ray in therapeutics, especially in the treatment of the different types of sarcoma and carcinoma, is now rarely to be found in current literature. Already two leading journals, not devoted to the specialty, have favorably considered the subject. Our esteemed contemporary, the Editor of the Medical Review of Reviews, himself a surgeon, who devotes much of his valuable time to the study of the malignant diseases, sees something in the X-ray treatment, but takes the apologetic position, that he "refers to the subject now for the purpose of cautioning our readers against permitting feasible surgical procedure from being delayed a single day for the purpose of trying the X-ray. The only legitimate field for experiment," he adds, "is in cases properly classified as inoperable."

It is probable that far more general use will be made of the X-ray in the future than his position seems to predict. The large number of superficial cases of epithelioma which have been cured warrants, we believe, the use of the X-ray before the knife in all early diagnosed cases. Very many recurring after operation most promptly disappear under the influence of the X-ray. Why should it not preclude the knife? So emphatic is the expression of all who have made use of this method that it seems we have already passed the experimental stage, and that while conservatism in the employment of the rays, in some cases, may be wise, it is decidedly against the interest of humanity to place any barrier in the way of its universal use in the class of cases in which it has succeeded so much better than the knife.

Indeed the advocates of the X-ray are to be congratulated upon the general disposition of the profession, at the present time, to hold *sub judice* adverse expression of opinion, awaiting future developments. It is hoped that all who have entered upon this new and important field will proceed with great caution, and studiously investigate the progress of the subject. It is already too soon for any to become self-satisfied

in the methods which they have employed. While the general cautious methods succeed in superficial cases, no one to-day, we believe, is prepared to set up any precise method of action applicable to the deep-seated tumors. In fact, as in surgical procedures, every case calls for individual study and action, which, in the light of past experience, demands cautious and discreet application of the X-rays. So successful is surgery in many cases, in removing what appears to be the entire diseased tissue, that it would seem unjustifiable that those methods be entirely set aside. So certain, however, is the probability of recurrence, and so likely is it that the rays do affect in many ways malignant growths that it would seem at this time, in the light of past experience, unjustifiable in any case, where a malignant tumor has been removed, that it should not be subsequently subjected to the influence of the X-ray for a time that would probably prevent the return of the malady. We believe that the recognition already accorded is an assurance that the measure in the future will hold the position which will make its use at some time in the treatment of every malignant growth advisable, if not imperative, to good practice.

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#### **THE USE OF ELECTRICITY IN THE TREATMENT OF NERVOUS DISEASES.**

SO prevalent is the notion now among neurologists that electricity offers but little in the treatment of nervous diseases that, in the light of present experience, we feel justified in saying that humanity is the sufferer when those who should know better, possibly in ignorance, state what is absolutely untrue. The forms of neuritis and other nervous conditions arising from inflammatory causes are amenable to treatment by electricity. And it is time that those outside the inner circle take issue in the interest of the sufferers. It is already well known and easily demonstrable by those familiar with the subject, that most inflammatory conditions, of either nervous or other special organic structures, acute or chronic, do yield most promptly to electricity, when scientifically applied. Few, indeed are the nervous conditions which do not arise either from some local congestive disturbance or are reflected from some source too

often undiscovered. Setting aside syphilitic, tuberculous and congenital conditions, as a rule the so-called neuroses can be generally benefited by the judicious employment of electricity, if seasonably applied.

The currents of high potential and small quantity, particularly the currents and other modalities derived from the static machine, are invaluable in the treatment of the diseases of the nervous system.

The victims of tabes who are so often subjected to specific treatment when no syphilitic lesion is present, if put under systematic static treatment are promptly relieved of their terrible pains, locomotion is materially improved, and eventually the affection is brought to a *statu quo*. No measure so well meets the indications of locomotor ataxia as one which induces the activity of dormant centers, lessens the undoubtedly local congestion of the lesion, and tones up in general the functions of the body.

The types of neuritis are promptly relieved, yielding to the modalities of high potential. Peripheral paralyses are cured, and the conditions associated with paralysis of central origin alleviated by the use of electricity as by no other measure. Most functional neuroses are responsive to proper electrical treatment, relief being either immediate or by removal of an exciting cause to which the affection may be traced.

The physician to-day who places static electricity, exclusively, in the category of suggestive therapeutic measures is one who is not well informed. Time only is necessary, and the day is not far distant when these facts will be firmly established.

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#### **PROGRAMME OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.**

**I**N another part of the JOURNAL will be found the complete programme for the meeting of the American Electro-Therapeutic Association. The meeting promises to be one of unusual interest, and a large attendance is assured.

## Progress in Physical Therapeutics.

### CONSTITUTIONAL DISEASES.

EDITED BY FRANCIS B. BISHOP, M. D.

#### *Treatment of Bell's Palsy.*

Facial paralysis, known also as Bell's Palsy, is a malady of considerable importance to the neurologist, especially to the neurologist who understands the application of electricity. The exposed position of the parts and resulting deformity, as well as the inconvenience from the constantly open and weeping eye, and, in some cases, the difficulty in eating and drinking, render the disease one worthy of special consideration.

While the tendency in the majority of cases is to recovery without assistance, very often the recovery is but partial. In some cases the inequality of recovery of the nerve supply of the affected muscles without assistance is associated with local irritability and contraction.

As a rule, the groups of muscles supplied by the different superficial branches of the seventh nerve respond in different degrees to the galvanic or induced currents, and in some instances do not respond at all, either because the trunk of the nerve is subjected to unequal pressures, or because the superficial branches from other causes become more or less degenerated. In long-standing cases the muscles become more or less atrophied.

These are the cases referred to in the text-books as being incurable, if they do not respond to the current after a certain number of weeks. This view is wrong, and it is to this class of cases that I wish to call attention.

Unless there is some destructive agent of central origin, or some pressure cutting off permanently the conductivity of the nerve trunk in the bony canal, I believe that all cases are susceptible to cure or improvement.

The method that I have employed for the past three years is as follows: Two sponge electrodes, two inches each in diameter; one under each ear over the stylo-mastoid foramen. A large pad sponge-electrode, high up on back of neck and base of the skull. The two small electrodes are negative, the large one positive. A current of 10 ma. is allowed to pass for five minutes. The small electrodes are then removed and a single electrode, sufficiently large to cover the entire paralyzed surface, is pressed upon the face on the paralyzed side. The current at zero is now reversed, and 15 ma. allowed to pass for five minutes, the positive electrode upon the cheek. The pad

is then removed from the face, the current again reversed, and with a small interrupting electrode, each set of muscles is very gently stimulated with the negative pole.

We may often be unable to excite even the slightest response with either the negative or positive of either the galvanic or the induced current. The muscles, however, should be treated with mild interruptions, just the same, and even when they do respond to a very strong current only, they should not be subjected to such a current, any more than a very weak man should be made to do hard manual labor. Another point to remember is that the seventh nerve supplies all the muscles of expression, the muscles that draw the face up as well as those that pull it down. Therefore, if in our treatment of a case we neglect to treat the muscles supplied by the lower branches of the nerve we are very apt to have spasmoidic twitching and pulling upward of the paralyzed side, as the other group of muscles improve and gather strength.

I have followed the treatment outlined above—in a number of very chronic cases,—one of four years' standing, another of two, and two of one year's duration,—all with perfect success. In some old cases we may have to work patiently for six months or more without any sign of improvement, but patience and perseverance will usually be rewarded.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D.

### *Tuberculosis of the Prostate.* L. R. G. Crandon.

Crandon finds that tuberculosis of the prostate may be primary, though it is nearly always secondary to tuberculosis elsewhere in the genito-urinary tract and the infection is usually an ascending one. Its diagnosis is of importance, and he remarks that prognosis is always grave. A gleet or a catarrhal prostatitis persists; there is pain in the prostate or neck of the bladder; there may be a drop of blood in the beginning of micturition instead of at the end, as in stone. There is an increased frequency of micturition and there may be some burning. The urine is slightly turbid and contains no renal elements. The prostate is found to be soft, slightly enlarged, and tender, especially far back and including the area of the trigonum. One or both vesicles may show enlargement, but this is probably secondary. To finally rule out stone the sound should be used, but with the greatest gentleness, for nothing so serves to stir up tuberculous process in the prostate as instrumentation. The treatment is not considered.

*A Discussion of the Operative Treatment of Prostatic Hypertrophy; with the Presentation of Specimens and Models Bearing on the Subject.* Bramford Lewis, Journal of Cutaneous and Genito-Urinary Diseases, New York, July.

The various methods of operating for prostatic hypertrophy are noticed by Lewis, who reports several interesting cases. He sums up the points favoring the different operations, as follows: For the suprapubic route: 1. General enlargement of the prostate with extreme intravesical projection of the median or lateral lobes, diminishing their accessibility from the perineum. 2. Marked pedunculation of the intravesical tumors, with absence of obstruction from other sources. Favorable for the perineal route: 1. General hypertrophy, involving the median and lateral lobes, without extreme intravesical projection. 2. Large or very thick bar formation; marked compression of the urethra between the enlarged lateral lobes. 3. Excessive development of the prostate in the direction of the rectum. 4. In most cases where the patient is in good general condition and there is not a special indication favoring one of the other procedures. Favorable for the Bottini: 1. Cases of extreme debility, unable to stand one of the severer operations. 2. Cases of bar or medium sessile obstruction, of not too great dimensions. 3. Incomplete collar formation. 4. Horwitz says it should be employed as a prophylactic against further obstructive hypertrophy at the beginning of catheter-life. Supra-pubic cystotomy for drainage only is a palliative measure that has certain well-defined and highly advantageous features—not with reference to curing a case of prostatic obstruction, but for the purpose of improving conditions so that curative measures may be undertaken. It can be carried out under local (infiltration) anaesthesia, without adding to the seriousness of the conditions; and the drainage that it affords may work wonders in the manner mentioned. As a substitute for this incision, being even milder still in its effects, he commends a method that he has carried out on one or two cases, as follows: Suprapubic puncture with trocar and cannula; withdrawal of the trocar; insertion of a soft rubber catheter retained in the bladder; withdrawal of the cannula, leaving the catheter retained in the bladder and held in place by safety-pins and proper bandages. He drained one case for ten days in this manner and without ill effect.

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*The Morning Drop: Its Treatment.* Ferd. C. Valentine, Medical News, New York, July 19.

The following are the conclusions which this writer wishes to impress. 1. That the morning drop is ordinarily a symptom of local or constitutional disturbance. 2. That when it is not due to either of these, it is maintained by over-treatment

or artificial sexual irritation. 3. That according to its cause, it must be treated; locally, if due to a local cause, and constitutionally, if faulty metabolism or food irritation be the provoking element; if sexual irritation be the cause, this must be stopped. 4. That if the morning drop be due to over-treatment, it must be discontinued. 5. That the cause of the morning drop is not difficult to ascertain. 6. That its treatment is within the sphere of the general practitioner.

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*Tuberculosis of the Testicle.* Paul Thorndike, American Medicine, Philadelphia, July 5.

The author has looked up some seventy-five cases and finds as points of value from his study that the disease is one that occurs in young adults, and, in about one case out of every three, gonorrhea was the immediate cause of the tuberculous process. In only twenty per cent. of the cases were there any symptoms relating to the urinary tract, and in only sixteen per cent. was the vas deferens probably involved at the time of the operation. This means that the operation is performed on account of the presence of diseased foci in order to remove the active inflammatory mass, and most of the cases do not come under observation until a fairly late stage. The occurrence of complications of the vas deferens in only sixteen per cent. is in contrast to the common opinion that it extends by direct extension along this duct. The clinical point suggested is the query: "Is it necessary to remove all the diseased area in order to benefit the patient?" He says that he has never hesitated to operate for proper surgical indications because the disease was known to be present in other organs, and has had cases under observation which were enormously benefited by this course. Many patients will consent to a lesser procedure while absolutely refusing the greater one.

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*Tuberculosis of the Urinary Tract.* Boston Medical and Surgical Journal, July 3.

Edgar Garceau has collected from various sources a total of 415 cases of operations on the kidney, including 257 nephrectomies, 42 nephrotomies, 84 nephrotomies followed by nephrectomies, and various nephrectomies complicated by other operations or resections. The total surviving two years or more was 58, or fourteen per cent. The percentage of cases well from within a few months of the operation and, therefore, promising ones, added to the survivors of two years, making a total percentage of 58. The reason the results are not better is that renal tuberculosis is rarely primary in the kidney, and the patient who has been nephrectomized for tuberculosis should never be considered safe for the future, and he must keep himself up to the highest pitch of vigor, and keep down the disease which may be lurking elsewhere. The largest

number of cases of nephrectomy was in females, which does not coincide with the autopsy records and the disproportion is remarkable. Morris explains it by saying that the coexistence of renal with vesical tuberculosis, or with disease in some other part of the male genito-urinary organs, renders many men unfit for operation upon the kidney, and Garceau suggests that the greater difficulty of recognizing latent renal tuberculosis in the male may also be responsible. The majority of cases occur in the third and fourth decades of life, and the miliary form is far more common. Tuberculosis of the other organs is mentioned 54 times. The type was chronic in all cases; old foci probably existed in a large number of cases and would vitiate the figures. Morris also says that old foci of tuberculosis are also found in the prostate, testicles, or lungs in cases of kidney tuberculosis. It is seldom a primary disease; direct infection through the urethra is not a common event. The question as to whether the primary seat of origin of tuberculosis is in the kidney or elsewhere is noticed, and from the figures it appears that the kidney is affected primarily oftener in females. There is no doubt that vesical tuberculosis as a primary disease is most frequent in males. It is possible that many male cases do not survive long enough to allow extension to the kidney, while in the females the kidney is the more common seat. The increasing use of the cystoscope will reveal more in regard to these points in the future than in the past.

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## LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.,

*A General Consideration of Hyperplasia of the Lingual Tonsil.*  
The lingual tonsil is not recognized, as a rule, in its ætiologic relation to throat-cough, faucial irritation, *globus hystericus*, and other reflex disturbances, which explains the lack of success so often experienced in the treatment of such cases. An interesting article on this subject recently published by Seymour Oppenheimer, in the *Annals of Otology, Rhinology, and Laryngology*, May, 1902, is therefore opportune, and the following abstract will be of interest:

The lingual tonsil is situated in the glosso-epiglottic fossa and is in intimate relation with the base of the tongue and the superior opening of the vocal apparatus. The glands constituting the fourth tonsil influence, to a marked extent, the integrity of this region. Placed upon a base of lingual muscle fibers and separated from them by a layer of connective tissue, the individual glands roughly grouped to each side of the median glosso-epiglottic ligament produce separate aggrega-

tions of tissue which, on examination, will show very clearly the presence of two tonsils instead of one.

Normally the tonsil is spread over the surface and does not project outward, as do the faucial tonsils, the glands being less elevated than those comprising the other tonsils. Unlike the faucial tonsil, the lymph masses are not bound into a single mass, but even when hypertrophied, remain more or less isolated, it being always possible to recognize a definite interspace between the individual glands.

The lingual tonsil is developed at an early age, and in the child of ten or twelve years the glandular elements can be readily seen, and it is not uncommon to find the tonsil enlarged to some extent in at least twenty or thirty per cent. of children. Slight hypertrophy is rarely present before the fifth or sixth year, and marked hyperplasia before the twentieth year, while the majority of cases which present symptoms referable to the lingual tonsil are usually observed during middle life.

While the majority of observers are inclined to the opinion that hypertrophy occurs more often in females than males, there is a constantly increasing number of reported cases in which the sex is evenly divided. In his own cases sex exerted no influence in regard to the development of hyperplasia, but the female presented more marked and varied symptoms than did the males. Hall expresses this forcibly when he says that at all events women more frequently complain of it than men. Roy, Scheppegrell (15 cases, 10 of which were females), McBride, and others regard it as being most common in women, while Ellett, Seifert (106 cases, 58 men and 48 women), and Browne with 69 per cent. males and 31 per cent. females, demonstrate that they have seen more cases in males, or that the cases were evenly divided. Undoubtedly, judging by the symptoms, it is more common to observe the condition in women, but if one will examine a number complaining of naso-pharyngeal lesions or even a series in which no symptoms referable to the upper respiratory tract are present, it will be surprising to find that the sexes are fairly divided, or, if there is appreciable difference, the males will predominate. Escat explains this by saying that, although hypertrophy is equally frequent in both sexes, the neuropathic reaction is more often expressed in females; thus giving rise to the erroneous impression that this sex is most frequently affected.

The factors concerned in the production of lingual hypertrophy do not differ in many respects from those acting on the faucial tonsils. The relation of gastro-intestinal disturbances is well defined in many cases. Constipation as allied to gastro-intestinal disorders plays a prominent part in the aetiology, but not as much in hyperplasia as in the associated condition of varix; this being present in individuals with disordered he-

patic functions, in which sluggish bowel movements are concomitant.

The rheumatic diathesis plays an important rôle in aggravating the symptoms when hyperplasia has developed. Rheumatism *per se* apparently exerts no influence in the development of the hyperplasia, and it is doubtful if the tonsil is involved as a prodromal symptom of an attack of acute rheumatism, as sometimes occurs in the faucial tonsils. With the predominance of varix, lithæmic and rheumatic diatheses do influence to a considerable extent the local lesion.

As to frequency, Arrowsmith found the lingual tonsil affected in 56 of 2000 cases; Scheppegræll saw 8 in 100 cases of naso-pharyngeal disease; Barnhill found it enlarged in 20 per cent. of cases and in 1 per cent. he found varix. In his own practice, both private and hospital, between 15 and 20 per cent. of all patients have more or less hypertrophy of these glands, while 2 or 3 per cent. have varix.

The symptoms are principally localized to the region involved or within its immediate vicinity, and may be either direct or reflex; depending to a great extent upon the temperament of the individual. The principal symptoms are the following: cough, foreign-body sensation, pæsthesias, voice changes, hemorrhage, and respiratory distress. Cough is the most frequent and constant of the symptom group resulting from the tonsilar changes. Of the extra-pulmonary coughs, that from the glosso-epiglottic space is undoubtedly the most frequent, and unless this portion of the respiratory tract be examined, as it should in every case of cough, serious errors in diagnosis must ensue. We should not depend entirely upon the statement of the patient as regards the seat of the symptoms and especially the cough, as the latter is frequently referred low down in the larynx or to the pharyngeal wall, when examination shows these parts to be normal, while the lingual tonsil is enlarged and varicosed.

Next in frequency to the constant hemming and cough, the patients complain of a sensation as if a foreign body was located at the base of the tongue. *Globus hystericus*, so-called, is another symptom in highly sensitive women, and frequently depends upon some lesion of the lingual tonsil, as demonstrated a number of years ago by Browne and later by Kronenberg. While this condition is frequently considered hysterical in its nature a large percentage will show varicose lingual veins, and a closer study of some cases will clear up the ætiology in not a few. Pain may be due to direct pressure upon the filaments of the glosso-pharyngeal nerve, but is rarely observed, as close questioning will show that it is not true pain, such as one finds in an inflammatory condition, but is merely an altered sensory stimulus. Hemorrhage is the characteristic symptom of lingual varix and it may simulate hemoptysis

or hematemesis, although its source rarely presents any difficulty to ascertain, as the dilated and tortuous veins, often several millimeters in diameter, are readily seen with the laryngoscope. It does not always indicate conjoint hyperplastic changes; as in many cases the tissue is normal or it may even be atrophied, one may confidently predict the presence of lingual varix. Respiratory distress may be slight from partial interference with the epiglottis, or it may be so intense as to cause great suffering from dyspnœa.

The laryngoscope is essential to recognize the growth and no difficulty should be experienced in determining this fact, but when reflex and obscure symptoms are present great difficulty is often met with in establishing the connection. The probe, in preference to the finger of the surgeon, should always be used to determine the consistency of the glands and to establish points of special tenderness from which both direct and reflex symptoms may originate.

The treatment depends entirely upon the character of the pathological changes present in the individual case. If the tonsil is but slightly enlarged from hyperplasia, attention to the general health, the avoidance of alcoholic drinks, smoking, or irritating food are recommended, and the parts are painted with tannin in glycerin several times weekly. The galvano-cautery, with a properly curved tip and long shank, is useful in reducing small glands, and it is the instrument pre-eminently adapted to destroy varicose veins. In using it, great care must be taken to avoid injuring any tissue but that which it is intended to destroy. If the veins are small they should be seared with the cautery at a cherry-red heat, while, if large and tortuous, they should be entirely destroyed. Only one or two veins are treated at each sitting, and the inflammatory reaction is allowed to disappear before another séance is held; usually a week's interval between each cauterization is sufficient. In those cases where the tonsils are hypertrophied and varix is present, the veins must be first destroyed and the enlarged mass afterward removed by whatever method is deemed advisable. Care must be taken to avoid hemorrhage as far as possible, as it is extremely difficult to control bleeding in this location.

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## DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D.

*The Place of Drugs in the Treatment of Stomach Troubles.* By Boardman Reed, M. D., International Medical Magazine for June.

The place for drugs in the treatment of many stomach troubles is in the drug store. This is true not only of certain affections, such as some of the forms of nervous dyspepsia, and

of gastralgia, etc., which are frequently merely symptomatic of disease in the nerve centers or elsewhere; it is true also of some others which really do involve the stomach. The drugs usually so freely administered in these cases, without an exact diagnosis having first been made, would be far better in the drug store than in stomachs which do not need them—to which also they are often sadly unsuited.

At all events, it is likely that the majority of medicines administered empirically, in cases of so-called dyspepsia, do more harm than good; and even after an accurate determination of the actual existing pathologic condition by a thorough external examination of the abdomen, an urinalysis, and a chemical and microscopic examination of the stomach contents (with possibly one also of the faeces), it is often found that hygienic or mechanical measures, such as a carefully selected diet, a freer use of pure drinking water, exercise, massage, electricity, etc., will accomplish much more than any course of medication.

Besides the numerous cases of indigestion which result directly or indirectly from imprudent eating and imperfect mastication, a large proportion of complaints of pain or discomfort in the stomach are either reflex phenomena or functional disturbances, the indirect consequences of unhygienic habits of work or play. Inordinate mental or nervous strain results in persons who have long overworked or over-dissipated with the help of stimulants (such as alcohol, strong coffee or tea, etc.), or of powerful nerve tonics; also, and perhaps with almost equal frequency, in persons addicted to sexual excesses or irregularities, including those who indulge in ungratified sexual excitement, as occurs so often with engaged lovers. In married persons, too, when the attempt is made to avoid offspring by incomplete coition (*Coitus interruptus*) the nervous system is always seriously injured sooner or later in one or both, and in all these instances of unnatural or unhygienic sexual practices the digestive function would seem to be often prominently involved.

In the neuroses of the stomach and in gastric upsets through the medium of injured nerve centers, drugs, while useful at times, especially for temporary alleviation, should play a subordinate rôle. This is particularly true when stimulants and nerve tonics have been already abused. What is wanted here is to get rid of the cause—*tolleré causam*—besides rest and time for recuperation of the exhausted nerve centers, with outdoor air, plenty of natural sleep, nourishing food, change of climate, sometimes, and often the mechanical methods of treatment. The over-ambitious professional or business man must be gotten away from his too engrossing occupation by a sea voyage or sojourn at the shore, a hunting trip, or, in the worst

cases, a rest cure, when there is nervous prostration showing itself often most conspicuously by anorexia in addition usually to headache and insomnia, by nausea and vomiting after meals, and sometimes by severe gastric pain as well, without any organic basis for such symptoms being discoverable in the digestive tract.

More hygienic habits and a more physiologic way of living, aided by a period of partial or complete rest, and when necessary by electricity, especially the galvanic or high-tension faradic currents intragastrically, light exercise, either active or passive, or both, and by the judicious use of water internally and externally, will cure most cases of neurasthenia with very few or no drugs, whether the gastro-intestinal tract or other regions be prominently implicated. Still, the usual nerve tonics, such as small doses of the bromides, the hypophosphites, the glycerophosphates, dilute phosphoric acid, and the preparations of iron, zinc, arsenic, silver, and gold can often be so judiciously employed as to assist the cure in cases in which they have not already been long administered for the reprehensible purpose of enabling the patient to go on over-doing or to persevere in violating Nature's laws in other ways.

The great secret in such conditions is to study each case by itself with the knowledge ever in mind that while some neurasthenics and nervous dyspeptics do not respond to anything less than the largest doses of nervine remedies (though even these patients are injured by them finally), others are seriously over-stimulated—poisoned really—by what might seem ridiculously small doses.

The only safe rule is to begin with minute doses and gradually increase, if necessary; always being content with the smallest that will produce the desired effect. When these cases of nervous dyspepsia are long neglected, serious derangement of the gastric secretion and impairment of the gastric motor power are likely to occur. Then certain special stomach remedies may come in place.

In diseases that really involve the stomach, there is frequently a place for drugs, and in certain of them a very important one, when you have learned exactly in what way the organ is affected; but the fact needs to be strongly emphasized that the old-fashioned method of treating all dyspeptic complaints as a single entity, and pouring into the unfortunate victim an endless variety of alleged remedies at random, is a dangerous kind of experimenting, which in this age of the world, with our improved methods of reaching an accurate diagnosis, is no longer defensible. It can only be excusable to prescribe thus blindly in cases where, on account of acute disease or of extreme age or debility, the use of the tube or of any intragastric instrument is impracticable. Even in such cases, however, very much can often be done by an expert ex-

ternal examination to aid in reaching a definite diagnosis, particularly with regard to the size, position, and motor power of the stomach, as well as to the fixity of the kidneys, one or both of which will be found loose and more or less movable in a very large proportion of our modern women who conform to the prevalent fashions in dress; also the position, sensitiveness, and size of the colon, especially its head and transverse portion. I have discussed in previous articles the methods of obtaining such information. All of these conditions have a direct bearing upon the functioning of the stomach, and an accurate determination of them, or even the most important of them, will enable you to use drugs with much greater precision and prospect of benefit than is possible without such knowledge.

Massage of the abdomen and also exercises for the trunk muscles, such as body bendings, twistings, etc., are non-medicinal measures which help to restore the secretion of the gastric juice when the peptic glands have been impaired, but not destroyed. When the HCl and pepsin, as well as the rennet ferment, are entirely wanting, as in gastric atrophy, it is generally best to abandon all efforts to promote peptic digestion and administer full doses of a good preparation of pancreas with an alkali.

In atrophy, too, strychnine may be useful to assist in overcoming any coincident deficient motor or propulsive power (which is an especially serious complication here) though gymnastics, massage, hydrotherapy, electricity, and especially intragastric faradism, will, any one of them, as a rule, accomplish more in such atonic conditions, as also in dilatation of the stomach from atonic causes.

In displacements of the stomach, unless the organ has been pulled down by a morbid growth, there is usually no need of surgery. Strychnine and diet will do something; abdominal supports, gymnastics, massage electricity, and hydrotherapy can do very much. Indeed in all the cases I have ever seen, these measures, when they could be long persevered with, have effected marked improvement, and in most of the cases not too aggravated, a virtual cure has finally resulted.

A volume could easily be written concerning the right and the wrong methods of employing medicines in gastric affections, but the foregoing hasty sketch may serve to call attention to the importance of the subject.

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## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D.

In a recent number of *Revue Internationale d'Electro-Therapie* the employment of Geissler tubes for the production of

chemical rays is very interestingly discussed by Leduc. This is of especial interest at this moment in view of the therapeutic value of the chemical rays, i. e., both the greater energy of the X-ray and the chemical activities of the arc, and also the tendency toward a better appreciation and more common use of vacuum tube electrodes.

That arc-light apparatus is expensive, and somewhat difficult to operate, must be conceded: therefore all simple and inexpensive methods capable of achieving similar therapeutic results bespeak attention.

The negative brush of a Geissler tube is a source of intense chemical activity, and the rays are not only very pure violet, but ultra-violet as well. The properties by which a Geissler tube is recognized and also utilized, fluorescence of glass, etc., are manifestations of the chemical rays. It is remarkable that there have been no studies in this direction. As the ultra-violet rays do not attract attention by their light they must be sought by other means, for example, photographically, by the fluorescence of glass and the discharge of electrified bodies.

Leduc takes up their study from this point of view, which he points out has been neglected. He finds that the light emitted from the negative brush exercises at a distance of several meters an intense photographic action upon one of the least sensitive of the bromide of silver papers as, for example, the velox. Upon the latter an instantaneous impression is made at a distance of several centimeters. This fact the experimenter can easily prove by placing the source of the rays in front of a blackened chamber, the wall of which is pierced with a hole by a needle. In thirty seconds an image of the same, enlarged four times, can be obtained on a gelatino-bromide plate at a distance of 0.8 m. from the wall. In the same manner there may be obtained, with equal facility, negatives directly upon paper. A bario-platino-cyanide screen may be substituted for the photographic surface and a beautiful fluorescent image obtained. These rays discharge rapidly electrical bodies.

A great deal of the energy employed is transformed into the chemical activities, as the negative brush of a Geissler tube does not produce luminous nor heat rays. There is no emission of the chemical rays from the positive terminal. In order to intercept the other rays Leduc enveloped the fluorescent part of the tube in black cardboard. A photograph of the entire tube showed that the middle part emitted many of the photographic rays. It is at that part that there is produced with the greatest intensity the fluorescence of glass with emissions of luminous rays. These rays constitute a greater part of the photographic action from the middle of the tube. A photograph of the negative brush showed that the emission of the chemical rays is due

to the violet gases encircling the cathode. This phenomenon is analogous to that which has been studied with electric points in air at atmosphere pressure. The rays of the negative brush of the Geissler tube, identical with the violet and ultra-violet rays of the spectrum, are reflected, refracted, and polarized; the beams can therefore be concentrated by lenses or mirrors, or scattered prisms.

By reason of the proportion of ultra-violet, the rays from the cathodic extremity of the Geissler tube are very absorbable, especially by glass. They should therefore be concentrated with lenses of quartz or with distilled water. By varying the relative distance and time of exposure Leduc made, by photographic action, a comparison of the quantity of the chemical rays of a Geissler tube animated by a small coil giving a 4-centimeter spark e. m. f. 4 volts, C. S. 2 amperes or 8 watts, and that of an arc, e. m. f. 60 volts, C. S. 8 amperes or 480 watts. In utilizing different distances and times of exposures, the photographic action of the electric arc was found to be twenty-five to thirty times greater than that of the Geissler tube: if the consumption of energy by the arc was sixty times greater than by the tube, then the yield from that in photographic rays will be twice as great as that of the arc. In reality, however, it is many times greater, because the consumption of current, while continuous for the arc, is intermittent for the tube.

On the other hand the activities of the arc includes many rays other than the violet and ultra-violet which take part in photographic action, but which are useless to the physician.

A comparison of the photographic action upon tints, and especially upon the rapidity with which the image appeared in the same bath, was made. Upon direct blackening paper but little impression was made by the rays of the tube, and the conclusion was therefore reached that they were not sensitive to the ultra-violet rays, but were impressed by some other rays.

The superiority of the yield in chemical rays from the Geissler tube is not because of the greater production, but because of the greater number which can be utilized than is possible from the arc-light activities. Because of the heat rays the arc must be operated at a distance of a meter from the diseased area, and while the energy is increased by the apparatus for concentration (lenses), there is by reason of the distance a loss by absorption and reflection. The increase, therefore, is but a little more than twenty times greater than without them.

The chemical activities from a Geissler tube can be applied by reason of the absence of heat directly upon the compressor at about 5 mm. from the skin: the density or concentration of the ray for that distance is for each unit of skin surface 40,000-times greater than at 1 meter. Although the source of the tube is thirty times feebler than the arc, still, despite the fact that the use of concentrating lenses multiplies the latter twenty

times, there remains for the Geissler tube an intensity of action sixty times greater than the arc, and a total yield more than 120 times as great. This by reason of the nearness of approach of the energy used to the surface to be treated.

Incandescent lamps in the light-bath can be replaced by Geissler tubes, and a given region of the body, or the entire body, can be submitted to the action of the beams of pure chemical rays. The intensity of this application can be increased by multiplying the sources and by concentrating the beams by lenses or mirrors. Treatment by means of the concentrated chemical rays is more efficacious with increased time of exposure, the obstacle limiting the prolongation being the fatigue of the patient induced by the immobility necessary when condensing lenses are used with the arc. This objection does not hold with the use of the Geissler tube fixed upon the compressor. The patient united to the generator by flexible cords only does not need to be immobile, and can read, write, or do needle-work during the séance, prolonged as deemed suitable.

Despite the frequent repetition of his experiences and the care with which they have been conducted, Leduc does not conceal the fact that his results have only been approximate. He has employed for comparison a lamp of 8 amperes, while Finsen recommends a lamp of not less than 25 amperes and uses lamps of 80 amperes. For convenience Leduc has placed his lamp at 1 meter; the method of Finsen permits it to be placed at 75 centimeters. On the other hand, it is to be said that the Geissler tubes give a much greater proportion of ultra-violet rays than the method of Finsen, and these seem to be the more efficacious. In conclusion Leduc states that he has only used the smaller Geissler tubes of commerce, and believes that without question tubes may be specially constructed for the production and utilization of the chemical rays, generated by strong inductors, or by powerful electro-static machines, which will give much greater effects. He regards the Geissler tube as a veritable lamp of chemical rays. (Abstracted from *Revue Internationale d'Electro-Therapie*, February, 1902.)

The above article has been given very fully as a prelude to a discussion of vacuum tube electrodes and their uses, operated either by inductors or by a resonator as per the method of Oudin, in connection with an electro-static machine. Just what position vacuum tube discharges occupy in relation to light and the X-ray must be determined by further experimental work as well as clinical study. The value of the negative brush discharge with vacuum tube electrodes has already been clinically established to the satisfaction of the editor of this department, and the subject will be presented in a coming issue of *ADVANCED THERAPEUTICS*.

*Electric Light in Respiratory Diseases.*

The above subject is discussed by Freudenthal in New York Medical Journal July 12, 1902, with reports of several cases of tuberculosis and one of hay asthma. He finds in the electric arc an adjuvant of very great value in the treatment of these conditions. He reiterates the well-known fact that light directly and indirectly exerts a great influence on the metabolism of the whole system when applied to the skin, and therefore can be advantageously utilized in some constitutional diseases. According to Strelbel the ultra-violet rays barely penetrate the epidermis, even when applied in concentrated form. The blue and violet rays, which are also bactericidal, are absorbed in the first thick layers of the blood vessels of the thoracic wall, while red and ultra-violet permeate the cutis and penetrate the deeper tissues. The same authority believes that the penetration of the rays must necessarily be accompanied by a modification in the motion of the waves, a temporary arrest. Light is converted into heat waves and perhaps even into long electrical waves. The transilluminated skin becomes translucent and appears of a brilliant red, and is therefore in a different state than ordinarily. That such a penetration of light cannot be without influence upon the molecular state of the tissues and their functions, is easily understood. Direct action upon the chemical processes and stimulation of the functions of the tissues and protoplasm in a reflex manner are the consequences of the exposure to light. Reference is made to the experiments of Bergel upon the influence of light upon the movement of the ciliated corpuscles. He found that the movements of the ciliated corpuscle gradually ceased in the absence of light, and recommenced under the influence of light sooner or later, according to the duration of the previous exposure to darkness.

Freudenthal uses in his private office the marine search-light illustrated in the July number of ADVANCED THERAPEUTICS with the carbons arranged on long focus, and both with and without the screen of blue glass. He keeps a supply of linen on ice at hand and bathes the exposed parts quickly as soon as they become hot. Freudenthal believes, as was pointed out by the editor of this department several years since, that the beneficial results obtained in tubercular and, for that matter, other cases is due to all the activities of the arc. (The Electric Arc Bath, New York Medical Journal, Jan. 28 and Feb. 4, 1899, and Journal of Physical Therapeutics, July, 1901.)

His results are confirmatory of those obtained by the writer from 1895 to 1898, and reported in The Electric Arc Bath. It is rare that in any given pathology one remedial means or agent will secure the desired result, and certainly the electric arc cannot be regarded as a panacea in the treatment of tubercular and other conditions, but it is an adjuvant so pow-

erful that its use should not only be neglected but in every possible way encouraged.

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*The Therapeutic Action of Blue Electric Light.*

M. Minier, *Revue Internationale d'Electrotherapie*, January, 1902, calls attention to the sedative and also anæsthetic action of blue electric light. He finds that under the influence of blue electric light a granular surface becomes anæmic, but becomes, on the contrary, congested under the influence of white light. Two minor surgical operations are reported where anaesthesia of the parts was obtained first by exposure to blue electric light. One involved the removal of a piece of glass, the other the placing of several sutures. Both made excellent recoveries.

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**DERMATOLOGY.**

EDITED BY ALBERT C. GEYSER, M. D.

A. Ravogli, in the Cincinnati Lancet-Clinic, gives a description of his photo-therapeutic apparatus. It is a modification of the Finsen lamp known as the Lortet and Genoud lamp:

"In this apparatus the condenser has been largely done away with and the light has been placed very near the lenses, so as to prevent the dispersion of the rays. Two carbons receive the continuous current and form a round ball of light exceedingly powerful, which, through the lenses, is projected on the skin. A small reflector on the back of the light prevents any dispersion of light backward.

"The lenses are of quartz, and water circulates in them and in the shield which contains the light, so that the apparatus is perfectly cool. Through this device the heat rays are prevented from going through, without any obstacle to the passage of the chemical rays.

"The lenses are changed according to the size of the affected skin to be exposed. The photo-chemical intensity is so strong that ten, fifteen, or twenty minutes' exposure is sufficient to produce the desired effect."

"Prof. Finsen has long since shown that various degrees of inflammation may be excited by exposure to the light, and the violet or ultra-violet rays possess bactericidal properties. It has also been shown in this country, by the work of Dr. Gottheil of New York, that these rays are capable of penetrating the tissues to a considerable depth; photographic plates having been affected by the light passing through the body. A number of cases of lupus and tuberculosis cutis, rodent ulcer, and syphilis have been reported as cured or much improved. However good results may be obtained, the same may be

equaled by exposure to the X-ray, associated with the static spray treatment.

"The physiological action of either treatment consists of a local erythema sometimes followed by the formation of vesicles, and after six or eight days it ends in an epidermic exfoliation. This inflammation causes a successive and gradual regression of the disease, which is revealed by the diminished congestion and by the reabsorption of the infiltration. Indeed, hypertrophic lupous nodules become flat, small, and in the middle show a kind of necrotic appearance and disappear; small nodules, in the same way, after two or three applications are scarcely recognizable. The effect of this treatment on ulcerated places is admirable. After an exposure of fifteen minutes the troublesome subjective symptoms of the ulcer are relieved, the patient feels no more itching or painful sensation, this being replaced by a feeling of warmth. The surface appears shiny, like it had been painted with gelatin. Ulcerous excavations, the yellowish necrotic appearance of tubercular ulcers disappear, and a healthy layer of cicatrix extends from the edges, which gradually heals up the ulcerated surface."

A. D. Rockwell, in the *Medical Critic*, under *Electro-Therapeutics*, states:

"As in other surgical procedures, one's success in electrolytic treatment of subcutaneous nævi depends very much upon the perfection of his technique.

"Because these tumors are so susceptible to resolution under electrolysis, it does not follow that extreme care and watchfulness are unnecessary in order to avoid bad results.

"There is so much that is capricious and uncertain in electrical treatment, both medical and surgical, that it is a satisfaction to be able to turn to morbid conditions where the action of electricity is governed by unalterable fixed laws, and where its effects are specific and certain. Subcutaneous nævi, or erectile or vascular tumors, is one of these conditions on the surgical side where electricity in the form of electrolysis can be invariably relied upon to resolve the morbid growth with certainty, and permanently. Its advantages over the knife or other surgical methods seem not to be altogether appreciated. When we consider the absolute freedom from hemorrhage, the very slight discomfort occasioned, and with proper precaution, the insignificant scar left, there can be no question of its superiority over other methods."

In speaking of the technique he makes mention of the unipolar as well as the bipolar method. We, however, as a rule, are in favor of the unipolar method. The needle, as the active electrode, should be either of gold or platinum; for a number of times it has occurred that, after using steel needles, black spots have remained as a consequent action of electrolytic decomposition of the iron; it having deposited an oxychloride of

iron in the tissues. Another point we would also emphasize—the negative electrode in these cases should be as large as possible, for the lower the voltage of the current the less pain does the patient suffer.

The results are all that can be desired. The naevus disappears, leaving instead a very small, white cicatrix, which could not be seen unless special attention were called to it.

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*Action of Physical Reagents in the Domain of Medical Electricity in the Treatment of Lupus.* By Dr. Leredde, Director of School of Dermatology, Paris, in the Journal D'Electro-thérapie. (Extracts, translated from French by G. M. Wasse, M. D.)

Methods of treatment of tubercular lupus (lupus of Willan), and of lupus erythematosus (lupus of Cazenave), to be studied are: Galvano-cautery method, high frequency, radiotherapy, phototherapy.

In the first and last the action of electricity on the tissues is nil, but electricity is used in their production.

First I must speak as a dermatologist, and consider the various forms of lupus, in order to understand well the action of these various methods.

I admit that lupus erythematosus is a tuberculosis of the skin, albeit extremely attenuated. The tubercular nature of the lupus of Willan is beyond all question, it is usually more virulent than the lupus of Cazenave. The anatomical process in these two forms differs, although all kinds of intermediary forms exist.

Lupus erythematosus presents superficial, aberrant conges-tive forms, susceptible of spontaneous retrogression where vascular lesions predominate, and deep tenacious forms, where these exist besides grave lesions of connective tissue, epidermis, and of the epithelial annexa. In all forms the commencement appears to be in the subcutaneous capillaries, as it is in the other tuberculoses, particularly in the indurated erythema of Bazin, the deep origin of which is clinically evident.

Tubercular lupus is rarely found of a superficial type. It should be considered as a reticular, tubercular lymphangitis, which usually commences, although not always, in the nasal mucous membrane. The depth of the lesions in lupus tuberculosus of the face surpasses all one would imagine *a priori*. The proof of this is easy: It is very rarely that chemical caustics, deep as is their action, cure lupus, and further, the complete removal of the lupus with subcutaneous tissue, as in the practice of Lang of Vienna, is followed by forty-eight per cent. of relapses.

In the treatment of lupus, in choosing one's method, one

should never forget these considerations on its depth and structure, as I can further elucidate. One must not forget its tubercular nature, always extraordinarily rebellious to all treatment. And we should remember that it is also parasitic; and liable to multiply fast wherever the sterilization of affected regions has been incomplete. One must endeavor in all cases to treat as deeply as the lesions extend, and to sterilize the parts thoroughly, if he intends, as he should, to produce a complete cure, and not a mere amelioration.

It usually attacks the face: therefore, other things being equal, it is best to choose a method which will leave the smallest scar.

Finally, as to painfulness of treatment, phototherapy and radiotherapy are painless, high frequency currents only cause discomfort, and galvano-cautery causes severe pain.

Galvano-cautery Method.—Effects: 1: Destruction of bacilli. 2. Death of tissues, followed gradually by liquefaction and removal of the necrosed regions. 3. Repair by consecutive dermic sclerosis and cicatrization, deep and superficial. . .

The process of repair has not been studied closely. It is certain that its regularity depends on the regular and rapid removal of dead products, and that the dressing applied to parts after galvano-cauterization plays, by its physical qualities, the greatest rôle in the cosmetic effect following treatment. One must note here that the best scars after this method will not compare with those after scarification, nor above all with those of phototherapy, which is comprehensible enough if one considers the severity of the method, and the complications due to secondary infections. The amount of scarring depends largely on individual technique, which is yet crude when all is said.

Whatever may be the services which this method has rendered, it is evident that it has its faults, and that now, with newer methods at hand, its field of application is limited.

I have seen a large number of cases of lupus erythematosus treated by this method, I have myself treated a certain number. Results are not usually very good. I believe they would be better if it were determined precisely in what forms of lupus of Cazenave the method should be chosen.

Following cauterizations of tubercular lupus there is a largish discharge of the soft tissue, but cauterizations of lupus erythematosus do not have the same effect, and often there are only limited scars, which disappear slowly. Phenomena of reaction are then but little marked after galvano-cautery, and here is, no doubt, a reason why cautery has no better results than in Willan's lupus.

Further, it seems to me that the majority of dermatologists that I have seen use galvano-cautery in lupus erythematosus do not use it boldly or deeply enough, despite the resistance of

the tissues to the cautery knife, and despite cosmetic considerations, which have their value, but solely, as I have pointed out above, with regard to the first consideration, that the patient should be cured.

We have to-day, in the treatment of lupus erythematosus, methods at once more certain as to cure and more satisfactory as to appearance. High-frequency currents in the superficial congestive forms, phototherapy in the fixed forms, are certainly preferable in a general way, and galvano-cautery should have but restricted applications. One may consider its employment in the fixed very deep lupus erythematosus which resists phototherapy, a condition which has to be met very boldly. But when it is a matter of great depth and considerable destruction of tissue, thermo-cautery is superior to galvano-cautery. In brief we believe it should no longer be used, except quite exceptionally in the treatment of the lupus of Cazenave.

What are its applications in tubercular lupus? In all cases where this consists of small "lupomes" one or two mm. diameter, isolated, visible under the thinned epidermis, the galvano-cautery point is indicated, and should be thrust into the "lupome." A sort of crater is made, through which the tubercular follicle will be discharged.

Unfortunately, we know that for the cure of a chronic abscess it does not suffice to incise it. The walls must also be thoroughly asepticized. So in "lupomes" the pericaseous region is doubtless modified by the galvano-cautery, but facts prove that usually this is not sufficient. For between the "lupomes" often lies tubercular spots, non-casefied zones—fertile, however, and bacillus-laden Pathological histology shows that the lesions of tubercular lupus commence below and work towards the surface; many "lupomes" are not visible when we use the galvano-cautery; in short it is to be feared that during the process of repair, reinoculations of tubercle take place easily in the cicatrizing tissues. This explains the defects of galvano-cautery and its lack of success in soft lupus; cautery cannot be by isolated points, it must be widespread, the trouble is that one cannot go deep enough.

With Finsen, galvano-cautery has no indications in tubercular lupus, where the treatment should be by phototherapy from the first. I differ from this, and as I have seen a great number of cases of lupus of Willan cured by galvano-cautery under the hands of my venerated master, M. Besnier, I think that this method should be retained, because of its practical advantages, and because it is within the reach of every physician. But, in my opinion, it should not be applied to lesions so small that they could be removed with healing by first intention. In other cases the doctor may use galvano-cautery, but after treating carefully for two months, he should let the patient rest long enough for the scars to take on a definite ap-

pearance. Should there yet be numerous "lupomes," it would be better to stop, for it is certain that the patient will not be cured, and besides it would transform the lupous tissue into a semi-sclerous tissue rebellious to the action of the chemical rays, and the lupus would become incurable.

**Electricity of High Frequency.**—We shall not occupy ourselves with the mode of action of high frequency in the treatment of tubercular lupus, its action being very uncertain. The currents of Tesla and D'Arsonval have, however, been used in the lupus of Willan and some very favorable results have been published. But cases of amelioration have no value, and high frequency should not be used unless it has curative value, which is already extremely doubtful. To settle this point, statistics are needed of a sufficient number of cases, all treated by this method, giving both the successes and failures, and the state of the patients several months after apparent cure.

In lupus erythematosus, on the contrary, high frequency constitutes a remarkable therapeutic agent, and which is destined to displace most of the former methods in the treatment of congestive forms. The work of Dr. Jacquot, inspired by M. Brocq, shows this in an extremely clear way. It is established that lupus of the "aberrant" type of Brocq is cured by high frequency in the majority of cases; it is not the same in fixed lupus, where, to all appearance, high frequency cures only in cases of purely erythematous forms. It is, therefore, important to study the action of high frequency in lupus erythematosus and interpret the results obtained. Unfortunately this has scarcely been done, and data are wanting. At present we are reduced to hypotheses.

(a) It has been demonstrated by Friedenthal, Bonome and Viola, Doumer and Oudin, that high frequency (h. f.), has no regular bactericidal action. It is not possible that this action is the cause of the subsidence of lupus erythematosus.

(p) The local action on the nervous system is not doubtful, manifested as it is by the anaesthesia which accompanies and follows applications of h. f. It would be easy to build a theory on this premise, and to admit a reflex action causing vascular contraction, and the cure of the erythematous process. But we have happily arrived at an epoch where theories of this kind, however plausible, meet fewer disciples, particularly in dermatology, since the advent of works which have largely restricted the rôle of the nervous system in lesions of the skin, and in particular those (works) which I have devoted to the subject.

The interest of taking up this research is not limited to enabling us to establish as yet unpublished facts, but to furnish us, under the mode of action of h. f. currents, data permitting us perhaps to extend the field of its application and to

modify the technique in the treatment of lupus of Cazenave so as to obtain better results.

It is probable that here, as in phototherapy, the physical condition of the tissues plays an important rôle, and that it may be this which impedes action on deep tissues. The researches of Finsen have shown the causes which limit deep penetration of the chemical rays, and how we can facilitate penetration. It is to be hoped that, by improvements of technique, we can also carry the waves of h. f. to a greater depth and through tissues which to-day we cannot traverse.

**Radiotherapy.**—We cannot yet judge exactly of the action, or mode of action of radiotherapy in the treatment of lupus tuberculosus erythematosus. While phototherapy, for instance, is one of the most studied therapeutic methods which exist, while its value has been established by numerous statistics, which leave no room for doubt, radiotherapy is an uncertain method, often of slight activity, sometimes too active, capable of causing severe burns, deep and slow to heal. On account of the energy of which it is capable, radiotherapy may have a great future in the treatment of lupus, as of other serious, deep lesions of the skin, rebellious to chemical methods, and to other physical methods having less energy. But it needs a very precise regulation, an exact dosage which does not yet exist.

The published results from various sources on radiotherapy in lupus tuberculosus are open to dispute, because no author has published a sufficient number of cases, and because, granting known cases of cure, it is to be feared that the failures have not been published, so that one cannot get at any statistics of the percentage of cures, and finally because, as regards accidents, many are not made known to the medical public.

If numerous radiologists have obtained "ameliorations" it may be objected that any amelioration of a lupus represents, when it is not question of a curative method, but a prolongation of the malady.

That radiotherapy can be a method of cure we do not doubt. The question is to know under what conditions it will be constantly so, like phototherapy. Schiff, Freund, and Kumell have shown that it can, like the latter, make excellent cicatrices; on the other hand, there is no pain unless the action of the rays has been too strong. Radiotherapy appears to be about to enter on a period where it will be applied to the regular treatment of lupus and where one can establish its relative advantages and disadvantages, as compared with phototherapy. The recent labors of Oudin are very encouraging in this direction. One must observe, however, that the technique indicated, if serious accidents are to be avoided, does not permit the hope of very rapid results, and that the duration of

treatment by the X-rays will at least equal that of the treatment by chemical rays.

The study of radiotherapy shou'd, above all, be followed in cases of lupus tuberculosis and lupus erythematosus rebellious to phototherapy.

Before discussing the action of radiotherapy on lupous skin, we ought first to enquire if it is really the X-rays that act in this manner. We know that X-ray accidents have been attributed both to the X-rays proper, and to the high frequency-currents (sparks) set up around the tubes, and it does not seem doubtful that the curative action is due to the same cause as the accidents. Oudin has shown recently that the injuries are due to the X-rays. Burns are more frequent in using tubes rich in X-rays and are so much the deeper as these are the more penetrating. Screens which impede the passage of the X-rays prevent burns, those which allow their passage (aluminium foil), permit burns. Kienbock has had identical results.

The mode of action of X-rays on lupous tissues has not been studied; that on non-lupous tissues in an incomplete manner. We know to-day that the Roentgen rays have not, under normal conditions, any bactericidal action, and it may be concluded, it seems, that their effect on lupus is due to their action on the tissues, nor to action on bacteria or the reactions which these produce.

**Phototherapy.**—The admirable discoveries of Finsen cannot be demonstrated here in a complete way. They have accomplished the cure of lupus tuberculosis in the greater part of cases incurable by other means. Phototherapy is, then, to-day the most important method of all, the sole resource of patients in whom relapse has followed ablation, galvano-cautery, scari-fication. Finsen states that but two per cent. of cases of lupus are incurable by his method, and adds that soon there will not be a single case of lupus in Denmark, except those of recent origin.

In lupus erythematosus Finsen's researches and mine agree. We estimate the percentage of cures at about fifty per cent. The statistics which I have published on this subject with my assistant, Dr. Pautrier, and which number thirty-three cases, prove that we have had cases incurable by other methods almost always. Here, as in the lupus of Willan, phototherapy is the last resource of incurables, and often cures them.

The study of the mode of action of phototherapy on the tissues takes in two heads:

1. Which of the rays of the spectrum act on the tissues?
2. How do they act?

(a) Entirely due to the chemical rays, those of short-wave length, comprised in the violet and ultra-violet part of the spectrum.

Absorption of the chemical rays by the blood, consequent necessity to cause anaemia of the tissues by compression so as to allow deep penetration of the rays, further the possibility of determining the depth (of penetration) simply by the degree of anaemia.

In lupus of the extremities phototherapy has not so much action as on the face. Here lupus is much more curable by the old methods than is lupus of the face, and phototherapy is only exceptionally indicated.

(b) How do they act? It is demonstrated that the chemical rays are pre-eminently the bactericidal rays.

[Here follows a long study in histology.]

## RADIOGRAPHY.

EDITED BY HERMAN GRAD, M. D.

*New Apparatus for Therapeutic Applications of the Roentgen Ray to the Larynx, Tongue, Rectum, Prostate, Cervix, Vagina, etc.,* by E. W. Caldwell, B. S., New York Medical Journal, July 12, 1902.

"It has been noticed that the X-ray, when used as a therapeutic agent, is most effective when the part under treatment is superficial, or so situated that the rays can reach it directly without first passing through intervening healthy tissue. . . . A few cases of malignant growths of the larynx which have been treated by applying X-ray through the side of the neck. . . . In all of these cases the improvement has been exceedingly slow, and the best results were obtained when the exposures were such as to cause a more or less unpleasant dermatitis of the neck. . . . I have therefore devised some apparatus which may be placed in the mouth in such a position that the X-rays will be thrown directly upon the larynx.

"The essential part of the apparatus is a new type of X-ray tubes. In these tubes the target is placed not within the spherical part as usual, but at the end of a tubular projection from it.

"The cathode is placed just within a tubular prolongation which extends nearly to the center of the spherical part.

"In one tube the target is completely insulated and the anode is placed at the end of a third tubular projection from the spherical part.

"If the positive terminal of the exciting machine is connected to a ground wire the tubular projection carrying the anode may be used as a handle, and no shock will be felt either by the operator or the patient, when the machine is in operation. This form of tube may be used without any special device for holding it, and the tubular projection carrying the

target may be readily introduced through any of the common forms of vaginal and rectal specula, for applying the rays directly to the cervix, the vagina, the rectum, or the prostate gland through the rectum. Since the outer surface is of smooth glass it may be easily cleaned and sterilized, and it might even be inserted through an artificial sinus in the abdominal wall for applying the rays directly to advanced malignant growths of the viscera. When it is to be used in the mouth, it is well to have the glass flattened behind the target. This enables the target to be brought very close to the soft palate and in just about the same position occupied by a laryngoscopic mirror. It is obvious that with the target in this position the rays will fall directly upon every part that can be seen in such a mirror. The second tube is similar in appearance to the first one, but the target is provided with a connecting wire extending through the glass and may therefore be made the anode. With this form of the tube it is desirable to use a shield and handle. The shield is a tubular hood of sheet metal, which slips over the projection carrying the target and performs several important functions. It protects the glass against breakage; it contains an aperture through which the X-rays pass and therefore limits the area exposed to their action, and finally it makes contact with the connecting wire of the target and completes the electrical connection between the target and the handle, which is of course, connected to the positive terminal of the exciting machine and to ground.

"The metal handle supports the shield and the tube and is provided with a switch so placed that it can be operated by the thumb, and arranged to ground the negative wire, thus short-circuiting the tube, stopping the X-ray, and, at the same time, making both wires safe to handle, even while the exciting apparatus is in operation.

"If a strong exciting current be used, the target ends of these tubes very quickly become hot. However, it should be remembered that with these tubes the source of the X-ray is brought five or ten times closer to the part under treatment, than is possible with the ordinary X-ray tube. Now since the effect of the rays decreases approximately as the square of the distance from their source, these tubes, with a given excitation, should have about twenty-five to one hundred times the effect of an ordinary tube, hence it is not necessary to use a strong exciting current or to make long exposures with them.

"If an induction coil is used with this apparatus a series spark-gap of one or two inches should be included in the circuit, in order to prevent short-circuiting the secondary winding of the coil when the tube is short-circuited by the switch at the handle.

"It has not yet been used enough to warrant any statement as to its efficacy, but enough has been done to demonstrate

that such tubes may be operated satisfactorily. It is hoped that they may be of value to those who are using the X-ray as a therapeutic agent."

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*Foreign Body in the Lung*, by T. A. Korteweg, M. D., of Leyden, Annals of Surgery, July, 1902.

"Mr. H., aged twenty-three, was wounded in the battle of April 17, 1900, by fragments of lyddite shell exploding at a few paces distant. One of the fragments struck him in front of the right shoulder, penetrating between the second and third ribs into the right lung. X-ray examination showed that the fragment was situated behind the second rib, and probably retained there by the resistance offered by the right main bronchus and the large blood vessels.

"There were scarcely any symptoms following the injury. The wounded man ran as fast as the others for a distance of two thousand paces, and cried with all his might. Several hours later, after having his other wounds dressed, he became greatly oppressed by severe dyspncea. The oppression soon gave way ; he had, however, a difficulty in speaking.

"Unlike the other wounds the wound in the breast soon healed. A few days after the injury was sustained the patient coughed up dirty, stinking blood. The expectoration soon decreased, except that now and then he would raise some phlegm. A few weeks later all symptoms ceased and the patient would have considered himself well of the breast wound, had he not pain on deep inspiration. This pain caused him to restrain himself as much as possible when sneezing. Two months later he was suddenly taken with coughing and expectorated some pure blood. He was then advised to go to Holland, and entered the Municipal Hospital in Amsterdam.

"On the 17th of October, 1900, the second rib was resected and the scar was followed down to the lung. Nothing further was done except to tampon the wound. On October 30 another radiograph was taken and it was found that the fragment was in the same position. The next day, by means of pins introduced into the wound, it was found that the fragment was just 7.5 centimeters from the anterior surface of the chest wall.

"With the aid of curved needles the operator ingeniously extracted the fragment, and also two pieces of cloth. The whole cavity, 11 centimeters deep, was then tamponed. The splinter removed measured 4 1-2 centimeters in length, 1-2 centimeter thick, and weighed 42 grams."

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*Ureteral Calculus Removed by Extra-peritoneal Operation*, by Dr. Charles P. Noble, American Gynecology, July, 1902.

The author calls attention to the great value of the X-ray in renal surgery and gives the following illustrative case:



Illustrating Foreign Body in the Lung.—Korteweg.



Illustrating Foreign Body in the Lung.—Korteweg.

"Mr. E. Came under the author's care in April, 1892, with a history of renal colic on the left side, and suppression of urine; these attacks having extended over a period of two years. Repeated urine examination showed a constant presence of red blood corpuscles. An X-ray picture showed a stone in the left ureter at the pelvic brim. An operation was undertaken on April 30.

"An incision was made parallel to the course of the ureter, being partly below and partly above a line drawn from the umbilicus to the left anterior spine of the ilium. The peritoneum was reached and pushed off the posterior wall of the abdomen until the iliac and abdominal vessels could be palpated. . . . The thickened ureter was found and traced into the pelvis about 2 cm. below the brim of the pelvis—that is, just below the iliac vein—a stone weighing 0.5 gram was located." The ureter was incised and the stone removed. The rent in the ureter was then closed with catgut sutures and a small drain inserted. "The patient made an uninterrupted recovery and was discharged on the twenty-sixth day.

"This case is reported as illustrating the progress which surgery has made in dealing with stone in the urinary tract. Also as showing the importance of the X-ray in the department of surgery. In this case it prevented the performance of an unnecessary operation. Without the X-ray a diagnosis of stone in the kidney would have been made, and the primary incision would have been a lumbar one to expose the kidney. It would not have been suspected that the stone was in the ureter until the kidney had unavailingly been searched for stone, unless the operator had taken the precaution of peeling the fatty capsule of the kidney and exposed the ureter, and thus noticed its dilated condition. He might have even laid open the kidney in his search for the stone, which was not evident on palpation. Having the X-ray report that the stone was in the ureter, and that the kidney was free from stone, all this unnecessary manipulation was avoided, and the operation was a direct and a most satisfactory one."

## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D.

*The Pathology of the Tissue Changes Caused by the Röntgen Rays, with Special Reference to the Treatment of Malignant Growths.* By Carl Beck, M. D., New York; N. Y. Medical Journal, May 24, 1902.

Some time ago (Medical Record, January 18, 1902) I suggested that there might be distinguished three different degrees, just as in ordinary burns, the first degree being char-

acterized by the symptoms of hyperæmia, the cutis being infiltrated and the temperature somewhat higher. Exfoliation takes place in small scales. The most pronounced subjective symptom is a tormenting itch in the skin. Effluvium capillorum, which manifests itself, as a rule, without showing any visible signs in the integument, belongs to the same category. It seems that there is a regressive metamorphosis (atrophy) of the differentiated elements of the skin, viz., the glands, hairs, and nails.

The main feature of the second degree consists in the formation of blisters, the clear or yellowish contents of which lift the corneous from the mucous stratum of the rete Malpighii. The inflammatory signs are well pronounced, the tension is considerable, and the pain is intense accordingly. After the removal of the blisters the corium is exposed as a red and sore surface (bullosus form of Röntgen-ray dermatitis).

The third and gravest degree is characterized by the escharotic destruction of the irradiated tissues. They show the signs of dry gangrene, and their appearance is brownish-black. If they exfoliate by a slow suppurating process, or if they are removed, as they should be, by surgical interference, a granulating ulcer remains, the cicatrization of which may take months (necrotic form of Röntgen-ray dermatitis).

The most characteristic difference between ordinary burns and the integumental changes produced by the Röntgen light is that the latter do not manifest themselves before the lapse of a period of incubation, as a rule, after about two weeks.

This stage, which we may properly call the latent, lasts about ten days in the simple type of Röntgen-ray dermatosis. At first there is a light, later dark, redness, and finally the skin becomes brown and scaled. After a few weeks there is complete recovery. Sometimes slight pigmentation of the integument remains.

In the bullous type of the Röntgen-ray dermatitis, after an incubation of about two weeks, intense reaction takes place. This lasts about as long as the period of incubation. Then cicatrization takes place. If the area of irradiation was covered with hairs, depilation occurs. The process of regeneration of the hair is slow. Pigmentation and teleangiectasis nearly always remain. The necrotic type of the Röntgen-ray dermatitis, as a rule, develops a few days later than the bullous form and requires months for its cure.

The peculiar chemical influence of the Röntgen light on the tissues impairs the nutrition of the cells.

The fact that in some individuals dermatitis has supervened after a few exposures, while others have remained free for years, suggests the existence of an idiosyncrasy.

We may assume that, if in chronic inflammatory processes constriction of the vessels takes place, the papillæ starve. A

hair extracted after prolonged irradiation is found to have lost its structure. It ends in a point instead of showing a root. Integumental specimens show thickening of the tunica intima of the small blood-vessels, a process which tends to narrow their caliber. Fibrous tissue in reticular arrangement is deposited. The tunica muscularis and tunica adventitia are affected in the same manner.

The influence of the rays on integumental disease is similar in regard to hypertrichosis, favus, eczema, psoriasis, rosea, acne vulgaris, prurigo, etc.

The tissue change taking place in neoplasms is also of the nature of a chronic inflammation. The nutrition of their superficial strata is disturbed, the cells starve, and if overirradiation is continued, necrosis may be the result. Thus we understand the curative influence on lupus, carcinoma, and sarcoma, especially if these neoplasms are confined to the integument.

Successful treatment of lupus is reported by many. To the cases published by me previously I may add one of facial lupus erythematoses in a woman of twenty-five years, who was irradiated fifteen times before reaction occurred. It was not until the twentieth exposure that the redness decreased and some of the nodules began to shrink. After the twenty-fifth exposure the ulcerations had cicatrized, the scabs had disappeared, and no nodules were found. The redness still persisted for six weeks. It was treated with unguentum zincosalicylicum. The cure is perfect.

The curing influence of the Röntgen rays on carcinomatous tissue can also be no longer doubted. Morton, Allen, Pusey, Williams, Wiegel, and others, besides myself, have reported cures in epithelioma. All integumental forms of carcinoma are accessible to Röntgenotherapy, also the tongue and the cervix uteri at an early stage. In spite of this fact, I should regard it as extremely unwise to leave to the rays what can be done much quicker and more effectively with the scalpel, namely, by extensive removal.

But irradiation should be considered in the after-treatment as well as in "inoperable" cases. Even after a thorough operation, carcinoma cells are often left in the deeper strata which cannot be reached by the surgical knife. We must consider that in the majority of cases the recurrence of carcinoma is caused by the epithelial cells of the primarily affected area—and but rarely by those of the secondary foci. Local recurrence, the most frequent form, is always produced by the carcinomatous cells which were left back at the operation, while the indirect type originates from such neighboring tissue, which at the time of the operation appeared to be normal, but in fact carried the embryonic elements of carcinomatous infection.

A carcinomatous portion, however, left at the time of operation must not necessarily always be the cause of further infection. The *vis medicatrix naturae* often attempts to secure a natural protection by surrounding cancer alveoli with giant cells, which, as microscopical examination shows, starts a regressive metamorphosis analogous to the well-known healing processes in tuberculosis. It is the abundance of the epithelial toxines which prepares the soil for the new invasion and further development of the carcinoma-cells. This also explains the rare occurrence of blood-metastasis in carcinoma. If these cells could not really be destroyed, but if only a regressive metamorphosis was induced by the rays, a great advance in the treatment of this horrible disease would be made. I have so far treated five cases of recurrent carcinoma mammae after the operation. In a case of adenocarcinoma, recurring three months after most extensive removal by an excellent surgeon, a large infiltrated mass, reaching from the sternum to the axilla, had formed within another three months. The supraclavicular region, the shoulder, and the whole upper extremity of that side were cedematous to the utmost. Near the sternum was a small ulcerating area. The patient suffered temporary pain of great intensity. The whole area was exposed then, first at intervals and then every day on an average of twenty minutes. There have been sixteen exposures altogether up to the present time. After the fourteenth exposure the infiltrated area began to shrink and the oedema disappeared entirely. The recurring growth had reached the pleura, as was evident from the presence of a pleuritic effusion, which was aspirated. A specimen taken from the irradiated area showed colloid degeneration, the adenoid character having disappeared. This seems to some extent to show the mode of cell metamorphosis which the cells undergo after irradiation. A microscopical examination, made by Dr. H. Kreuder, at St. Mark's Hospital, revealed the following condition: Adenocarcinoma with beginning colloid degeneration. The tumor shows a resemblance to glandular structure; in most parts the alveoli are completely filled with epithelial cells, so that in some places they appear like alveolar carcinoma.

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#### *The X-ray in the Treatment of Leprosy.*

The Hawaiian Board of Health propose to test the possibilities of the X-ray treatment in leprosy. This is certainly a very commendable step and it is hoped that it will bring relief to many sufferers.

The authorities should be commended for their alertness, and may their efforts be crowned with success.

"Some of the Therapeutic Uses of X-ray," by Dr. E. D. Bondurant in the New York Journal of August 2, 1902, is a

valuable article. He reports three cases, one of carcinoma and two of epithelioma, and also one case of lupus vulgaris.

The carcinoma was an extreme case, presenting an ulcer on the face with diameters of 3 1-2 x 4 inches, associated with all of its attendant evils.

This case has so far improved that the doctor thinks there is almost a certainty of complete recovery.

In one case of epithelioma, a very malignant one, on the nose and recurring after the second radical operation for its removal, the rays had a very decided effect, resulting in a complete cure, and no recurrence after three months.

The other case of epithelioma and the case of lupus reported were progressing as favorably as could be expected, and with all chances of making complete recovery.

The doctor calls special attention to the power of the rays in relieving neuralgic and other pains, as well as the pains of cancer.

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#### *X-rays in Carcinoma of the Breast.*

H. Lewis Jones, in the London Lancet of February 22, 1902, reports an interesting case of carcinoma of the breast, the ulcer measuring 4 x 5 inches in diameter. The case progressed well for four weeks, when the rays were stopped on account of general metastasis, but nevertheless the ulcer continued to heal and progressed to a complete cure of ulcer, but the supposition is that the patient died from the effect of the metastasis. We would like to know why the metastasis cannot be treated and cured in many cases by the ray?

Dr. Percy Shields, in the Cincinnati Lancet Clinic, of April 28, 1902, reports three cases of epithelioma and two complete recoveries, and another nearly cured. One of these cases has been discharged for six months and there is no sign of recurrence. Dr. S. gives an extensive description of a mask he uses in his treatments with the rays.

In the Medical Record of July 19, 1902, appears an extract from a paper read by Dr. D. Bryson Delavan, in which he advocates the use of X-rays in the treatment of carcinoma of the larynx.

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#### *Hemorrhage of Fibroid Tumors Controlled with the X-ray.*

I have been treating a case of multiple fibroid of immense size in which hemorrhage has been a prominent symptom. It has been treated about two months with galvanism, and during the last six weeks the X-ray has been alternated with galvanism. The hemorrhage was so bad previous to treatment and after the use of 150 milliamperes of current for two weeks that the X-ray was brought into use to assist in the control of the hemorrhage, which was checked after the first ten minutes' exposure and it has occurred but three or four

times since, and is promptly checked by the exposure to the ray, and the author is satisfied that it is an important adjunct to the treatment in those cases, and hopes for help in all cases of hemorrhage from uterus that is not of septic origin.

### THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

In the Dietetic and Hygienic Gazette for April, 1902, Dr. C. E. Angell discusses "Dry Hot Air and the Functions of the Skin." The applications referred to are those administered as in the Turkish bath, where the patient enters a chamber bodily, the air in which is heated. He says: "The average physician is ready enough to adopt any new theory or 'any old thing' in drugs, while too slow to see merit in the resources of hygiene or the potential possibilities of natural remedies. He is alike indifferent to sunshine, hot dry air, hot and cold water, or medical electricity. He is as ignorant of the consequences of overfeeding as of the benefits of judicious fasting. He is equally indifferent to the importance of ventilation, the advantages of skilled massage, or the value of suggestive therapeutics. Wise men are few, while the would-be wise are many."

We are inclined to think that Dr. Angell is somewhat too sweeping in his assertion that the "average" physician entertains the narrow mental attitude described above, but enough of this unfortunate spirit is abroad to justify, very largely, his pessimistic sentences. The "average" physician is but too unwilling to see any good in remedial measures other than medicinal or surgical, and many of his patients who could be benefited by rational physical therapeutics are thereby condemned to lives of invalidism. However, when we consider the magical character of some of the results of the application of natural agents, as compared with the results obtainable by ordinary means, it is not perhaps surprising that a physician of "average" intelligence, and totally without experience with these measures as most of them are, should be unable to view the tale in any other light than as "too good to be true."

He writes of the integument in relation to dry hot air applications as follows: "The skin may be said to possess four distinct functions.

"First, it is a covering for the exterior surface, which is permeated with a fine network of peripheral nerves.

"Second, it regulates the temperature of the body.

"Third, it is the analogue of the kidneys—an indispensable emunctory. It is the sewerage system of the general excretions, and the safety valve of the heart and circulatory system.

"Fourth, it is largely concerned in the function of respiration.

"These facts were well illustrated in the time of Leo X., who had a child gilded to represent the Golden Age. The death of the child soon followed from suffocation!

"There are more deaths resulting from occlusion of the pores of the skin than are dreamed of in our philosophy.

"The course of phthisis pulmonalis is greatly accelerated by stoppage or by neglect of the functions of the skin. Every sanitarium should possess dry hot-air baths, well constructed, well conducted, and well ventilated. No other agent can compare in effectiveness with dry air at high temperatures. Ventilation is indispensable to successful results. Without complete and constant ventilation dry air at high temperatures is not available, and anything short of this is inefficient.

"The average bather in the average hot-air chamber cannot remain long enough to be in any material sense benefited. At the end of twenty or thirty minutes he must retire from the room, or he will become unconscious, or at least suffer from a 'big head' and a congested brain."

The best way to give dry hot air is by inclosing the patient in a body apparatus, which permits of the patient's head being outside of the heat, whereby he breathes air that is free from the noxious exhalations of the skin, which are induced by the treatment. The disadvantage of breathing the heated air in which the body is immersed is graphically set forth by the following paragraph:

"In a recent visit to one of the largest and most pretentious dry hot-air bathing establishments of Greater New York, I resolved, if possible, to stick to the hot room at least thirty minutes, but was so completely prostrated before the end of that time that I could not leave the room without assistance."

In reference to the necessity of having the heated air really dry, he says: "The heat in these so-called dry hot-air baths is not dry, and the perspiration so eagerly sought is not perspiration at all.

"It is condensed moisture, which acts like a coat of varnish, checks evaporation, and abnormally augments instead of reducing the blood temperature."

Among the diseases mentioned as susceptible of beneficial influence by the treatment, are lumbago, sciatica, Bright's disease, urticaria, asthma, bronchitis, and eczema.

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"Scorching Treatment of Erysipelas.—Tregubow calls attention anew to the efficacy of treating erysipelas by exposure to the flame of alcohol until a burn of the first degree results. He uses a wad of cotton held in forceps and lighted after it has been dipped in alcohol. He holds it about half an inch from the skin, and as it begins to hurt he moves it along, thus

exposing the entire affected surface to the action of the flame. A lighted spirit lamp may be used instead of the cotton. He repeats the application two or three times a day, and usually found two days sufficient for a complete cure. This method of treating erysipelas comes from Bulgaria, where it is a common domestic remedy."—Jour. Am. Med. Asso'n.

In the Gaz. Hebd. de Bordeaux, for February, L. Lichtwitz writes of the treatment of some forms of lupus by dry hot air, applied at a temperature of from 150° F. to 250° F. He reports having cured three patients. He also reports that the treatment is not painful, but this statement is at variance with those of others, notably Werther, who says that a general anæsthetic should be administered. Both observers use a temperature of about the same height.

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## HYDROTHERAPY.

EDITED BY CURRAN POPE, M. D.

Hydrotherapy is that form of treatment which consists of the application of water, at varying temperatures and in different forms, to the surface of the body for prophylactic and therapeutic purposes. Water is universal, easily accessible, and it is strange that its use as a hygienic measure is so little understood and appreciated. By its rational and judicious use at proper temperatures many of the minor ills flesh is heir to can be prevented, incipient morbid processes cut short, and severe diseases cured. Even more curious is the lack of medical knowledge on this subject, though probably this is not greater than in the domain of massage, electricity, phototherapy, and the so-called mechanical methods. The trainer and athlete see the immense value of hydrotherapeutics and to-day, as in the Golden Age of Greece and Rome, it is utilized to perfect the human pugilistic machine for the "squared circle" and deeds of valor. As a matter of pleasure, as engendering the *bienfaisance* of our Gallic friends, the cold bath holds forth many temptations., and those who have had recourse to this delightful therapeutic measure realize to the fullest why the great baths of Rome became the center, not only of physical betterment, but the battlefield of intellectual bonsmots of that day and civilization. The magnificent and grand ruins of the Baths of Caracalla are a silent admonition to the general public to "go and do thou likewise." The saddening reflection comes when we realize that

but a small number of intelligent physicians could give the immediate and after effects of a cold application of water to the cutaneous surface. In assuming the editorship of this division of the JOURNAL OF ADVANCED THERAPEUTICS it shall be my endeavor to present the action of this remedy, in health and disease, in short, concise paragraphs freed from technicality and reduced as far as possible to the most practical basis, and in addition to review the current literature month by month.

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*Hydrotherapy as a Prophylactic.* By J. G. Nehrbas, M. D.,  
Medical and Surgical Monitor.

This writer calls attention to the fact ordinarily overlooked that hydrotherapy is not limited to the external application of water, but that transfusion of normal salt solution, gastric lavage, the vaginal douche, and the ice cap are parts of this agent. In water we have perhaps the most potent and universal hygienic agent for the promotion and maintenance of health, as a certain and powerful factor in preventing autointoxication. The writer's experience has been duplicated, I venture to state, by every hydrotherapist in America when he states that cases suffering with constant cold, cough, neuralgia, pains about the joints, dull headache, lassitude, and depression are promptly benefited and eventually cured by the use of sweating and the simple cold bath. [The editor wishes that the popular belief that a cold bath is dangerous to the health and well being of the human race could be dismissed.]

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The editor of The Medicus refers to what is almost a sinful lack of education by those who are in charge of medical schools. It is indeed remarkable that in the curriculum of no medical college in the United States do we find a chair upon the subject of hydrotherapy. Professor Fenton Turck, M. D., of Chicago, says " Hydrotherapy and other physical methods of treatment seem now to be almost a necessity in the armamenture of modern therapeutics, and a thorough and practical knowledge of these subjects should belong to every physician." The effects sought by the use of water externally can be summed up in the application of heat, cold, and moisture—very ordinary agents, but none the less potent. Cold water is a stimulant and does not depress or shock, as is ordinarily believed by physicians. The great advantage of the application of heat and cold by means of water is the flexibility of the agent and the immense gradations of intensity. In addition to temperature changes, we have the effects of the force of impact of the water, and duration. With such an agent nearly every indication in the range of disease can be met and overcome.

*The Application of Water in Chronic Diseases.* By Simon Baruch, M. D., Brooklyn Medical Journal.

This writer says truly that cold and heat are irritants which stimulate, the impressions being transmitted from the cutaneous sensory terminals to the central nervous and sympathetic systems. Inspiration is deepened by vagus action; heart action improved; increase of hemoglobin and blood cells; increased oxygen absorption and marked elimination. After the applications have been repeated for some time and the skin has undergone a certain training, the refreshing and invigorating effects are felt throughout the entire system. The writer notes the value of water in pulmonary tuberculosis and mentions several patients in whom appetite, nutrition and constructive metabolism occurred in such manner as to render the blood capable of resisting the development and existence of the tubercle bacillus. [The editor himself can ably indorse all that has been said and written by Dr. Baruch on this subject, having seen cases of pulmonary tuberculosis recover completely, with no evidence of return after a passage of five years.] In neurasthenia we find a fruitful field for hydrotherapy. In the obstinate cases this agent almost invariably changes the entire aspect of the case. The use of the hot-air, vapor, or electric-light bath to enhance the reactive power of the patient, followed by the rain, fan, jet, or other douche is provocative of changes of marked intensity. The thermic and mechanical stimuli gradually applied arouse depreciated neurons, enhance vasomotor activity, and improve nutrition generally. Under these treatments morbid ideas, morbid feelings, introspection, and depression cease, and the patient regains his equilibrium. In diabetes we have a malady which is usually treated with little hope of restoring health. Lives are prolonged by strict attention to diet, at the sacrifice of comfort and happiness. In this disease the glycogenic function is in abeyance, and there being no agent by which liver action can be enhanced, the loss of this function has left us nothing but to limit the supply of sugar-producing aliment. If we increase the circulation in the muscles, which is the particular effect of exercise, we enable the system to appropriate a large proportion of the sugar circulating in the blood. It is necessary to insist upon regular and constant exercise, though this requires great mental courage and determination, so great are the languor and inertness of the patient, and here is the point where hydrotherapy enters. The great physiological stimulant, cold, applied through the medium of water, combined with the mechanical stimulation of the douche, arouses nervous activity, increases vital capacity, contracts muscular tissue, embraces nutrition and hematosis, thereby increasing energy and removing indisposition to exercise. Such stimulating effect upon the nervous system, in a disease which is so

largely neurotic in many instances, conduces vastly to the restoration of health.

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## THERAPEUTIC EXERCISES.

EDITED BY WATSON L. SAVAGE.

*Physical Training Underlies Success.* By Prof. Dudley A. Sargent, in *Success.*

The attention which is now being given to physical culture and health often raises a question as to their value as a basis for success in life. Occasionally, some man who has risen to eminence in his chosen profession, and reached a ripe old age, declares that he has never taken any physical exercise that he could avoid, and attributes his success and long life to this fact. Then, again, some physician startles the world by asserting that all exercise, over and above what is required by one's occupation, is injurious to health. It would be impossible, within the limits of this brief article, to meet the exceptional conditions that probably prompt such radical assertions as these. But over against these exceptional cases may be arrayed such a mass of facts to the contrary that one is amazed at the temerity of a man who would attempt to refute, by a single assertion, the experience of ages. Looking at the subject largely, we find plenty of evidence that the nations that have given most attention to the development of the body and the care of the health have not only been of a superior quality physically, but they have invariably attained the greatest mental pre-eminence, and have excelled in the arts of war and of peace. According to Grote, the historian, Greece devoted more time to the physical training of her youth than to all other branches of education combined, and yet Galton tells us that the Greeks, as a people, were as superior to us in intellectual ability as we are superior to the African negroes. Among modern nations, Germany, England, and the United States rank the highest in mental attainments, and in industrial and commercial success, and yet these nations give more attention to the physical training and health of their school children than any others, through their admirable systems of gymnastics and athletic sports and games. If we seek for further evidence of mental superiority associated with fine physiques, we can find it in smaller groups than those represented by races or nations. The Fellows of the Royal Society in England probably represent as high an order of intellectual ability as any single group of men that can be elected. Yet, upon the evidence of the committee on anthropometry from the British Association for the Advancement of Science, these men average sixty-nine and three-fourths inches in stature.

The English professional people average sixty-nine and

fourteen-hundredths inches in height, which is only exceeded by the Scottish agricultural population, and by the London police, who represent a body of men selected especially for their fine physiques. The average Englishman, including all classes, is about sixty-seven inches in height. During my experience as instructor in physical training at Yale University, from 1873 to 1878, the first divisions in scholarship were almost invariably the best divisions in physical exercises. At Bowdoin College, according to the investigation made by President Hyde, in 1890, the most successful scholars, as a class, were found to have the best physiques. At Harvard University, it has been found that the percentage of scholarship men who show a high degree of physical power, as indicated by the strength test, is fully as large as that of the great body of students, while the percentage of weaklings is really less. In 1891, Dr. William T. Porter found, from the data obtained by the examination of thirty thousand school children in St. Louis, that, among the pupils of the same age, those who had succeeded in getting into the highest grades were the tallest, and weighed the most, and that those who were in the lowest grades were the shortest, and weighed the least.

Physical Superiority Begets Mental Growth and Induces Success.—In 1896 Dr. Porter's discovery was confirmed by Charles Roberts of England, who made a similar investigation with the school children of London. Mr. Roberts found that there is a definite relation between size of body, as determined by stature, weight, and chest girth, and precocity and dullness of intellect in children.

In other words, it has been found that, at corresponding ages, the more intelligent classes are taller and heavier than the less intelligent. The same conclusion has more recently been reached by Gratsianoff, in Moscow, Russia; by Dr. Hastings, in Omaha, Nebraska; by Dr. Christopher, in Chicago, Illinois; and by Dr. Beyer, in Cambridge, Massachusetts. If similar observations are made on a large number of school children in any city in the country, it will invariably be found that those who are the most successful in their studies have the best physiques, as shown by their superior height and weight for their age. As an illustration of the influence of judicious physical training upon a dull and sluggish stage of mind, the experiments tried at the Elmira Reformatory, in New York, in 1886, under the direction of Dr. Hamilton D. Wey, gives us the most convincing evidence. Dr. Wey selected some half-dozen of the most obtuse dullards that could be found in the reformatory, and had them put through a special course of vigorous physical training for one year. This class began at once to improve mentally and morally, as well as physically. All of them made such successful progress in their studies as to warrant their promotion from the lowest

into the higher grades, and most of them maintained their improved mental standing after the period of special training had elapsed. In any of our large cities, it will be found that the so-called poorer classes are not only poor in external evidences of wealth, such as comfortable homes and valuable properties, but they are actually poorer in person than their well-to-do and more successful neighbors. There is a difference of five inches between the average statures, and twenty pounds between the average weight of the best and poorest-nurtured classes. We also know that criminals and lunatics average less in height and weight than the general community, and that there is an ever-widening gulf between the physical and mental stamina of the highest and lowest strata of society. The relation between a good physique and high mental attainments, as shown by great nations, communities, and large groups of men, is a little more difficult to show in individual cases, because there are so many exceptions. But this is true of any deduction that can be made in regard to the human organism. If the student of biography will look up the life history of the men who have been the foremost leaders of the world, in every branch of service and kind of endeavor, he will find, almost invariably, that they have been men with sound bodies and vigorous minds. Among the men of worldwide fame possessing superior physique may be mentioned Plato, Demosthenes, Charlemagne, William the Conqueror, Martin Luther, Cromwell, Peter the Great, Samuel Johnson, Goethe, and Bismarck.

These Leaders have been Men of Hardy Physique.—Walter Scott, Robert Burns, and Professor Wilson of Scotland were distinguished nearly as much for their athletics as for their literary achievements. Peel, Brougham, Lyndhurst, Campbell, Bright, Palmerston, and Gladstone, and other great political and legal readers of England, were all men of vigorous health and hardy physiques. So were the great political orators, like Fox, Burke, and Chalmers of England, and Patrick Henry, Webster, Charles Sumner, Beecher, Chapin, Brooks, John Hall, and Dwight L. Moody of our own country. The great founders and preservers of the nation, like Washington, Franklin, Presidents Jackson and Lincoln, and some of the chief justices, like John Marshall, Lemuel Shaw, John B. Gibson, and Samuel F. Miller, were men of powerful bodies, capable of great physical strength and endurance. Our great financiers, manufacturers, and successful men of affairs, like Vanderbilt, McCormick, and Huntington, were of study stock and great constitutional vigor. So are Morgan, Carnegie, and the present-day leaders in the triumphs of gigantic business enterprises.

The twenty-nine distinguished Americans whose names were selected to adorn the "Hall of Fame," at the New York

University will be found to have been considerably above the average in height and weight; to have lived, upon an average, over seventy years; and to have been blessed with good working constitutions and very good health. It is true that many distinguished men, like Alexander, Napoleon, Milton, Wesley, Alexander Hamilton, Wellington, and General Roberts, of South African fame, have been below the average professional man in stature. In point of weight, however, it is a question whether they would not surpass the average. I think they would. Sometimes, such eminent men as Herbert Spencer, Darwin, and Francis Parkman, the historian, are brought forward as illustrations of men who have become distinguished and successful, in spite of being in feeble health. They all had strong constitutions, and Darwin had a vigorous physique, which he inherited from his father. He practiced athletics in his youth, and so did Francis Parkman, who continued doing so until a few years before his death. They were all prodigious workers, and each one impaired his health by over-application and almost constant mental strain. As soon as they found their health impaired they conserved their vital energies by reducing their social and extraneous duties to a minimum, lived under the most favorable hygienic conditions, and devoted themselves exclusively to their special pursuits, which called, however, for a broad range of mental activity. By pursuing this method they were able to accomplish an extraordinary amount of work, and to arrive at a tolerably good old age. Parkman lived to be seventy, Darwin to be seventy-three, and Herbert Spencer is still alive and active, at eighty-two. Although these men had, respectively, functional disturbances of the special senses, stomach, and nervous system, that impaired their efficiency in some directions, they could hardly be called invalids. Indeed, the great amount of mental work they did had its force-equivalent in the food they consumed. This food must have been digested and sent, as blood, to the brain, and then, as waste matter, thrown off from the system. These organic processes involve the action of the stomach, heart, lungs, liver, and other organs and parts of the body, which must be in fairly good condition to do the amount of work exacted from them for seventy odd years.

Thus, if the life one would lead is largely a mental one—and I have assumed all through this paper that the only success worth striving for is based on superior intelligence—the health and tone of the brain are entirely dependent upon the condition of the heart, stomach, lungs, and other bodily organs. The ability of these organs to do their work, and properly nourish the brain and nervous system, must either be inherited or acquired. It is the chief province of physical culture—or physical training, I prefer to call it—to improve the condition of the vital organs. This is effected through the exercises of

the muscular system. The muscular comprise about forty-six per cent. of the entire weight of the body, and are constantly consuming oxygen, and giving off carbonic acid. The amount of oxygen consumed by the body, as a whole, depends upon the activity of the muscles. Thus, if the amount is represented by one when the person is lying down, it will be increased to three and thirty-two hundredths when he is walking at the rate of three miles an hour, and by seven when he is running at the rate of six miles an hour. The first effect, therefore, of active exercise, is to increase respiration; that is, to make one breathe faster. This tends to quicken the action of the heart, so that it pumps the blood more rapidly through the body. But blood and lymph are, to the bones, muscles, nerves, and other parts of the organism, what food is to the body as a whole. They strengthen and nourish the various parts, and make them increase in size, power, and efficiency. The heart, lungs, and stomach, in return, are repaid for their efforts by an increase in their functional capacity; for it is a law of physiology that every bodily organ strengthens and enlarges in proportion as it is exercised, and shrinks and becomes enfeebled if it be comparatively unattended to and unemployed. Thus it is possible, through the influence of the will on the nerves and muscles, to start up increased chemical action in different parts of the body, and, in that way, attract to it an increased supply of blood. In this way it is possible to develop and strengthen different parts of the body, or different parts of the brain. If the brain is used excessively, it will rob the muscles of their just share of the body's nutriment; or, if the muscles are over-developed, it will tend to impoverish the brain. In both cases, the heart, stomach, and lungs may be weakened by the excessive drain upon them, and be the first to cry out for less work or more food; for these organs, though of fundamental importance, are the slaves of the master-tissues, nerves, muscles, and brain.

In the primitive times, when every man was his own farmer, hunter, carpenter, blacksmith, etc., the ordinary duties and employments of life were sufficiently diverse to bring all parts of the body into active exercise. But times have changed. Now, a man does some one thing for himself, and everything else is done for him. The minute division of labor and the extensive use of steam and electricity have wrought most radical changes in our methods of working and living. Not only is all of the mental work done by one class and all the physical work by another class, but even the mental and physical work are so divided and subdivided that it is possible for one to perform some necessary function in the business or industrial world by the employment of but very few muscles and faculties. This tendency to specialize, though it may lead to the successful development of an institution, a city or a community, makes it absolutely necessary that the individual

man should have some form of exercise or recreation to bring his unused faculties into action, and preserve a proper physical and mental balance, which alone insures health.

Just what the best physical training is for each individual, it is difficult to state, as a great deal depends upon hereditary influences, present environment, and past and present forms of activity. Many persons inherit so much vital capacity—just as persons sometimes inherit pecuniary capital—that they can live and thrive upon it a long time without making any effort to improve upon their original endowment. Others inherit only a train of physical and mental deficiencies, which, like other ancestral debts, have to be paid before the individual can begin to accumulate anything for himself. This class in the community has a hard struggle, and is severely handicapped in the race for the prizes and successes of life. The only course for such people to pursue is to enter, at once, hopefully and courageously, upon a systematic attempt at body-building. I can recall hundreds of cases that have thus made amends for a poor inheritance, and finally added greatly to their original stock of strength and vitality. Furthermore, if the environment is favorable, a very little regular physical exercise will keep one in good condition. By environment, in this case, I mean fresh air, suitable temperature, proper food, clothing, bathing, dwellings, and various hygienic conditions and surroundings that tend to promote health. Persons so agreeably situated may often find, in certain mental pursuits into which they enter earnestly and enthusiastically, a physical equivalent for a certain amount of bodily exercise. People who take large views of life, and fully realize the dignity and importance of their missions in the world, like many of the distinguished men I have mentioned, often experience this physical equivalent for exercise in their mental work. When people so constituted read, write, speak, or think, they do so all over, and feel the effects of it in every fiber of their being. But, unfortunately, most of us are not so highly organized, and have to resort to other methods to assure good physical results.

We have seen that the parts most used are the parts most developed; and, if they are used exclusively or excessively, they are developed at the expense and to the neglect of other parts. The intense rivalry and keen competition which are so apparent to-day, in all the pursuits of life, make this tendency to an excessive development in one direction very marked. We see it even in the various forms of athletics, when success is made the chief end in view. Thus, the gymnast cultivates his arms, the oarsman his back, the runner his legs, etc. Although the nervous system will permit of a certain amount of one-sided development with impunity, where health, strength and endurance are to be cultivated, it is always better that activity should be general, rather than local. A frequent change of organic activity, followed by complete rest, is the

most crying need of the hour. Those who are engaged in brain work should seek some form of exercise that brings the greatest number of muscles into play with the least expenditure of nervous energy, like rowing, swimming, etc. Those whose occupations call for powerful muscular efforts through the day, will find recreation in the evening, in mild forms of mental activity, like games of checkers, dominoes, or a good lecture, concert, or drama. Those who use their legs excessively should use their arms and chests more, and *vice versa*. A change of activity is the chief thing necessary, and just what this change would better be will depend upon the individual's usual employment. By thus engaging in some mild form of recreative exercise as a systematic thing, varying it a little, from day to day, it is possible for one not only to improve his physical and mental condition, but also to add to his stock of energy and constitutional vigor, upon which health, happiness, and success so frequently depend.

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## CLINICAL BACTERIOLOGY AND MICROSCOPY.

EDITED BY ARCHIBALD M'NEIL, M. D.

The general practitioner is rapidly waking up to the fact that a microscopic examination of the blood is a very important adjunct to the diagnosis of pathological conditions. As Cabot states, very often the simple discovery that the blood is normal may be of the greatest value in diagnosis. The absence of the greatly overworked malarial plasmodium in the blood may drive the physician into a corner and compel him to guess again, but the examination may also reveal to him the real cause of the trouble, or at least give him some valuable data on which to found his diagnosis.

The Widal reaction has become a necessity in the diagnosis of typhoid fever, and is now generally employed by physicians all over the country.

Enumerating the red and white blood corpuscles throws valuable light on almost all febrile conditions, and is often the means of making an accurate diagnosis where the actual condition of the case has previously been a matter of doubt and uncertainty. It has often been said that medicine is the science of guessing, and, unfortunately, there is much truth in the statement, but with the present facilities for scientific study and investigation the practice of medicine is fast becoming a real science, and while acute perception and common sense are just as valuable to the physician as they were fifty years ago, science reveals to the practitioner of to-day who possesses those attributes many things that were a sealed book to the doctor of a few decades ago. The physician of to-day not

only knows that certain conditions exist, but why they exist, which is a long step toward removing the cause of the disease, which is the real end sought by all progressive physicians.

There is hardly a case where an examination of the blood will not aid the physician in diagnosis, either by establishing the fact that certain conditions do exist or by eliminating the possibility of conditions supposed to exist. Of course a thorough familiarity with the normal histology of the blood is necessary, if one is to gather any information of pathological significance from blood examinations. In all blood examinations the personal equation of the examiner is quite as important a matter as any part of the examination. The power of making correct deductions and reaching logical conclusions from what the microscope reveals is to be obtained only by a thorough and conscientious study, first of normal histology and then of pathological conditions.

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#### NOTES AND COMMENTS.

Programme for the Twelfth Annual Meeting of the American Electro-Therapeutic Association, to be held at the Hotel Kaaterskill, September 2, 3, and 4.

September 2, Tuesday, first day: registration of members; morning session, 9 o'clock, executive session; calling the meeting to order by the president, Fred H. Morse, M. D., Melrose, Mass.; reading of minutes; report of the executive council; communications; election of members; appointment of temporary committees; report of committees; unfinished and miscellaneous business; resolutions and notices of motions; new business. Ten o'clock, scientific session: reading of minutes of previous meeting; addresses of welcome and responses; reception of honorary fellows and guests; communications; address of president; report of committee on arrangements; resolutions. Reports of standing committees on scientific questions: On Induction Coils and Alternators, by Dr. Margaret A. Cleaves, chairman. On Electrodes, by Dr. Charles R. Dickson, chairman. On Constant Current Generators and Controllers, by Dr. William J. Herdman, chairman. On Meters, by Dr. Emil Heuel, chairman. On Static Machine and Condensers, by Dr. William J. Morton, chairman. On Electric-Light Apparatus for Diagnosis and Therapy and the Roentgen X-ray, by Dr. C. O. Files, chairman, Portland, Me. On Cataphoresis, by Mr. John J. Carty, E. E., chairman. Papers: The Action and Uses of the X-rays in Therapeutics, by W. B. Snow, M. D., New York. On the Treatment of Cancer by X-rays, by Clarence Edward Skinner, M. D., LL. D., New Haven. Two o'clock, excursion by mountain wagons; 4 o'clock, afternoon session, first day: The X-rays in the Treatment of Cancer with Report of Cases, by J. D. Gibson, M. D., Birmingham, Ala. The X-rays in Tuberculosis and Malignant Diseases of the Larynx, by W. Scheppe�rell, A. M., M. D., New Orleans, La.

Light and the X-rays in the Treatment of Uterine Cancer, by Margaret A. Cleaves, M. D., New York. The X-rays and High Potential Frequency Currents in the Treatment of Lupus and other Tubercular Conditions, by S. Fairweather Wilson, M. D., Montreal, Can. Epithelioma of the Tongue and Some Therapeutic Notes on the X-rays, by Charles R. Dickson, M. D., Toronto, Can. 9:30 o'clock, parlor entertainment and concert.

September 3, Wednesday, second day, morning session: 9 o'clock, executive session; 9:30 o'clock, scientific session. A New System for Producing a slow Alternating Current of Large Amperage for Therapeutic Use, with Citation of Cases and Exhibition of the Apparatus, by Lucy Hall Brown, M. D., Brooklyn. Some Therapeutic Indications from the Use of the Electric-Light Bath, by T. D. Crothers, M. D., Hartford. Some Obstacles to the Progress of Electro-Therapeutics, by Charles O. Files, Portland, Me. Problems in Electro-Therapeutic Practice: a General Discussion—Members are invited to submit difficulties arising in practice, on which information or advice is desired, and to offer suggestions as to the solution of such problems. Discussion will be opened by Charles R. Dickson, M. D., Toronto, Can. 2:30 o'clock, afternoon session: Portable Electric Apparatus for Medical Use, by Robert Reyburn, M. D., Washington. Newman's Portable Galvanic Battery, by Robert Newman, M. D., New York. The Diffusion of Iodine by the Electric Current, by M. F. Wheatland, M. D., Newport, R. I. Arthritis Deformans, by Francis B. Bishop, M. D., Washington. The Relationship of Psychic Suggestion to Electro-Therapeutics, by Maurice F. Pilgrim, M. D., Boston. Executive meeting, election of officers; 7 o'clock, banquet; 9 o'clock, hop.

September 4, Thursday, third day, morning session: 9 o'clock a. m., scientific session; Personal Observation Touching the Medical Value of the Roentgen Ray, by R. J. Nunn, M. D., Savannah, Ga. Illustrative Cases in the Cataphoric Treatment of Cancer, by G. Betton Massey, M. D., Philadelphia, Pa. Current Differentiation Illustrated by a case of Peripheral Neuritis due to Parenchymatous Degeneration of the Cord, by A. D. Rockwell, M. D., New York. Vacuum Tube Discharges and their Uses, with Presentation of Electrodes, by Margaret A. Cleaves, M. D., New York. Committee Report on Nomenclature, by Mr. W. J. Jenks, E. E., New York. Cataphoresis, by Mr. J. J. Carty, E. E., New York. Plan for X-ray Work, by L. A. Weigel, M. D., Rochester, N. Y. Executive session, installation of officers; adjournment.

Return by Otis Elevating and Mountain Railroad to Catskill, then by night boat to New York. Night boat leaves Catskill at 7 p. m.

The whole trip both ways is \$3 for each; tickets to be obtained on boat or at the Catskill boat office, Pier 43, North River, foot of Christopher Street. Meals and staterooms extra. Staterooms ought to be secured in advance.

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## OUR ASSOCIATION.\*

BY FREDERICK H. MORSE, M. D., MELROSE, MASS.

Fellows of the American Electro-Therapeutic Association, visiting physicians, and friends:

When my predecessor, Dr. Wende, handed me this gavel, saying, "my responsibility is now over, and your trouble begins," I could not at that time fully appreciate the significance of his remark.

Those upon whom the duties of carrying on the work of the year of this Association, were located so remotely from each other—our secretary living in Harrisburg, Pa. (although not a small man he has frequently been lost), and the members of the Executive Council living in five different States and Canada, it has necessitated a large amount of correspondence.

The untiring efforts of my good friend Dr. Newman, who may properly be called "the Bismarck of our Association," is entitled to the greater share of the glory of managing the many details which are so essential to the success of all such conventions.

In the beginning of this, our thirteenth year of usefulness, it seems to me eminently fitting and proper that we should review ourselves as a society, that we may feel the more satisfied with the work that has been done and investigations that are still going on. Many of the physicians who were instrumental in originating this association are more or less active members to-day. It is with pleasure and profit that many recent members can look back through the years, and remember the many cheerful greetings and valuable suggestions that

\* President's address delivered at the twelfth annual meeting of the American Electro-Therapeutic Association, at the Hotel Kaaterskill, September 2, 1902.

we have received in the offices and by correspondence with these same fathers of our society. Their great help, while we were groping in the darkness, with our eyes on the glimmer ahead, made us realize that the more nearly we could obtain the truth from these best known sources, the better we could benefit suffering humanity, without too frequent resort to drugs or the knife. So by their persistent faith in the efficacy of electricity in its various forms in the treatment of disease they have continued to inspire confidence in their followers, to that extent that we are proud of the American Electro-Therapeutic Association, its record, and present standing. Probably most of us who have been interested in electro-therapeutics for several years have, on different occasions, presented papers on the subject before other medical societies, hoping to inspire some faith, or provoke a discussion that would bring enlightenment to our hearers, but such attempts have generally been futile, because of prejudice and lack of familiarity with the subject of the profession at large.

When some particular member of a medical society who has been considered the special oracle in that region condemns a newly advanced idea, no matter how unreasonable he may be, it has a far-reaching influence, and hence the arguments take but little root in such soil. In the face of the opposition of the profession at large, however, the many facts that are proven by our everyday definite results, and marked over a wider area of cases than by the usual methods, give a prominence to the treatment.

I do not propose to speak particularly of the opposition to the progress of electro-therapeutics, but we all know and feel keenly where, in our own medical societies, we have held many a spirited discussion, endeavoring to maintain the dignity of our position, on the principle that there is a strictly scientific aspect to this branch of treatment, and that it is as far removed from charlatanism as any medical or surgical treatment could be. Such results can be brought about only by the careful and painstaking investigation of new theories, and the honest and conscientious efforts of members of an association like ours.

This association has done much to diminish the prejudice of the profession at large, and the development of the X-ray has caused such a widespread interest that many are brought in

contact with electro-therapeutics who otherwise would have remained indifferent. If we will but observe the names of the various styles of batteries and electrodes—also methods of treatment of such as are named after their authors—there will be seen a great array of the names of the Fellows of this association. In fact, the names of nearly all the important implements in the American physician's electro-therapeutic armamentarium are suggested to the instrument makers by members of this society.

The work of this association, being the investigation and advancement of a branch of therapeutics about which there has been much controversy and uncertainty, deserves much credit. The statements in our papers and discussions of results obtained carry but little weight unless there is a rational explanation of methods adopted, showing the appearance of scientific research. Also, the ideas we are advancing must have a great advantage over the older methods, or there would be no reason for adopting new therapeutic measures, to add confusion to the already overcrowded *materia medica*. Thus, step by step, as recent discoveries, whether from France, Germany, our own country, or elsewhere, have been brought out, our members have done a large share of the work in America of dissecting the subjects for the true merits of the new idea.

I think I can safely say that the greater part of the writings on electro-therapeutics produced since the presentation of Apostoli's famous paper in 1887 before the British Medical Association, which marks the beginning of the new era of electro-therapeutics, more especially perhaps as pertains to gynecology, have been by men of our association. If I have any suggestion to make, it is that our members, when appointed on committees, especially for the deeper investigation of a new theory or apparatus, should feel the responsibility sufficiently to waken in them a spirit to make their best efforts—the improvement, verification, or condemnation of which is of great importance to every member of our society and the profession in general.

It is with this determination that we should accept the position; with the busy (and I hope this applies to every one of us), progressive physician, procrastination too often manifests itself, and when the annual meeting is again convened, the aforesaid committee simply reports "progress," or perhaps one member

has done it all. Remember, my fellow-associates, I am calling myself to account as well, for I have done the same thing in this society.

But after all it is the only sure way to true advancement, and no one, in endeavoring to do his whole duty on the particular committee to which he is appointed for the benefit of all, can fail to do himself much good by the necessary study involved.

This year we have many papers on the X-ray treatment of cancer and skin affections, which have been of the most interesting topics of discussion by the medical profession during the past year, and other subjects of great interest which have not yet been before the association, and I sincerely hope they will bring out a profitable discussion.

Metallic electrolysis and gynecological electro-therapeutics are subjects which have been dwelt upon at all our meetings, and I hope the enthusiasm will continue, for here repetition can be well tolerated and appreciated. To the new members, in the name of the association, I give a hearty welcome, assuring you that it is not the purpose of this society to make one man more prominent than another, but to act as a whole for our mutual benefit. I therefore feel at liberty to ask of the association for any information to make clear any point in the discussion, or anything that will add to your pleasure or benefit, for you are one of us, and we hope and expect you will enter into the enthusiasm of the proceedings on whatever subject may interest you.

So by inoculating ourselves with the spirit of the occasion whenever opportunity presents, the continued success of the American Electro-Therapeutic Association is assured, and each, feeling he has done his duty, will reap his reward.



**X-LIGHT IN THE TREATMENT OF CANCER.\***

BY CLARENCE EDWARD SKINNER, M. D., LL. D., NEW HAVEN, CONN.

Professor of Thermotherapy in the New York School of Physical Therapeutics; Editor of the Department of Thermotherapy in the JOURNAL OF ADVANCED THERAPEUTICS; Physician in charge of the Newhope Hot Air Sanitarium, New Haven, Conn.; Member of the American Medical Association, American Electro-Therapeutic Association, American Roentgen Ray Society, American Association for the Advancement of Science, Yale Medical Alumni Association, etc.

Probably no event since the discovery of the value of antisepsis has attracted so much attention, from both medical men and laymen, as the discovery of the power of the X-ray to overcome cancer. The announcement of the fact was first met by derisive incredulity; next by an unwilling admission that beneficial results had certainly been observed simultaneously with the administration of X-ray treatments to sores that seemed to be cancerous; and finally, before an overwhelming mass of clinical demonstration, skepticism has given way to amazed conviction.

It is not difficult to appreciate the incredulous attitude of the medical mind in this connection. From time immemorial cancer has ultimately destroyed seventy per cent. or more of the total number of its victims, in spite of any measure that could be applied for its relief, surgical or medicinal, and whatever the stage of the disease at which it came under treatment. Probably no other disease, with the possible exception of pulmonary tuberculosis, has been looked upon with so much hopeless dread and horror. Therefore, when the statement was made that X-light, which had not been previously known as a therapeutical measure at all, would not only entirely remove this hitherto intractable condition in many cases, but would accomplish the result without even producing discomfort on the part of the patient, it is not strange that the tidings should be looked upon as altogether too good to be true.

The beginning of the twentieth century has been marked by

\* Read at the twelfth annual meeting of the American Electro-Therapeutic Association, at the Hotel Kaaterskill, Greene County, N. Y., September 2, 1902.

the discovery of many wonderful and valuable things in nearly every department of industrial and professional activity. We are living in a period of marvelously rapid progress and achieving results, which, even ten years ago, would have been looked upon as hopelessly beyond the limits of human possibilities. The development of the X-ray in the treatment of cancer will go down to history as by no means the least of the discoveries of any age that have proved potent in the relief of human misery and in the saving of human life.

For the purposes of X-ray therapy, cancers need be divided into but two groups: those affecting the superficial soft tissues, and those involving the deep tissues and bones.

The observations of Chamberlain, Pusey, Morton, Williams, Snow, Allen, Montgomery, Schmidt, and many others, including the speaker, have proven beyond any possibility of doubt that external cancer is curable by X-rays as far as physical examination and subjective symptomatology can discover, in at least the very great majority of cases. Present statistics indicate that the proportion of cures will exceed ninety per cent.

In the second category are included malignant processes extending or existing more than half an inch below the surface of the skin. Most prominent in this group occur mammary cancer, uterine cancer, malignant processes affecting the intra-abdominal and intra-thoracic lymphatics, and bone cancers.

The efficacy of X-radiance in curing cases belonging in the first group is now so well established that the greatest interest in the matter centers upon the deeply seated growths, and I shall confine my remarks principally to personal observations upon thirty-three cases of this character which I have had under treatment during the past nine months.

I was first led to believe that deeply seated cancers might be amenable to X-light by my conviction that the beneficial influence which the agent undeniably exercises upon superficial cancer is due to the X-ray vibrations acting upon the cell elements of the growth, which elements are too weak and lacking in vitality to reach maturity and become the specialized tissue for which they were destined of themselves, in such a way as to give them new vitality, and hence ability to reach maturity and their normal ultimate structure. I have never considered the effect to be due to ozone formation, electrifica-

tion or electrolysis of the elements of the growth, the deposition of any acid upon the sore, or any other of the several explanations which have been advanced to the exclusion of a specific influence of X-light. We have used all these agents before, but they did not cure cancer until X-light came upon the scene.

With a good high-vacuum tube, one that forces back a spark-gap of not less than four inches, rays can be produced that penetrate clear through the body; hence a malignant growth in their path could not fail to be influenced by them, if X-light is capable of exerting influence. It was under the impulse generated by these thoughts that the study of the following cases was undertaken.

In order that the conclusions to be drawn from the observation of these cases, and to be stated later, may be grasped intelligently, it is necessary that the important points in each case be brought to view. The time at my disposal, however, will permit of but the briefest possible description, and if anyone desires further light in connection with any case it will give me great pleasure to answer his queries.

We will consider these cases, if you please, in five divisions. The first will include those which have reached a fatal termination; the second will consist of those in which bony tissue is involved; the third, abdominal cases still unfinished; the fourth is a series of mammary cancers; and the fifth is constituted by one case of sarcoma of the neck.

The first group includes nine cases.

CASE I.—Carcinoma. Diagnosis microscopically confirmed; situated originally in the cervix uteri, and recurrent after two operations, the last one being an hysterectomy and ovariotomy. The patient came under treatment December 20, 1901. At this time there was a tumor in the cicatrix in the anterior abdominal wall as large as a small orange, and an ulcer in the vaginal vault and anterior wall, starting from the cicatrix, as large as a silver dollar. Other small tumors were palpable in the abdominal cavity. Patient suffered severe pain constantly; there was profuse bloody purulent discharge from the vagina, and the condition was one of hopeless, helpless misery.

The first X-ray application markedly relieved the pain and soreness, and the patient slept well the night following for the first time in many weeks. After the fifth treatment patient was able to stand upon her feet for the first time in eight months. After the sixth treatment there was no pain, the

large tumor mentioned above had decreased to the size of an English walnut, and the smaller tumors in the abdomen had disappeared, the ulcer in the vagina had decreased to the size of a dime, and the bloody purulent discharge had become only a trace. These promising conditions continued for three weeks, when she began to have the discharge again with small masses of disintegrated tissue. This was accompanied by a temporary accession of pain, a rise in temperature, and slight acceleration of the pulse. These conditions subsided in about ten days, when she was again comfortable for several weeks more. During this time she gained slightly in weight. She then began to show symptoms of general toxæmia, a perforation of the rectum developed, accompanied by absolute intolerance of food on the part of the stomach, and she continued to fail gradually until the latter part of March, when death ended the scene.

During the first two months it seemed probable that an inhibitory and reparative influence was being secured, and there was no evidence at any time of any increase in the size or number of any of the lesions. The patient seemed to be dying slowly of general toxæmia and malnutrition. The only good results attributable to the rays in this case appear to be the relief of pain, whereby she was able to give up her morphine, and a slight prolongation of life.

CASE II.—Carcinoma of the cervix uteri, vaginal wall, bladder, and probably other structures, with a perforation into the bladder, so that all urine passed through the vagina. Patient came under treatment January 28, 1902. Pain had been constant and excessive for eight months. A profuse bloody, purulent discharge had been present during the same time. The patient was only able to sleep under the influence of heavy doses of morphine, was eating scarcely anything, and was wasted to a mere skeleton. After the second treatment pain began to lessen, and after the seventh she was able to give up her morphine and never resumed it again, the rest of her life being almost entirely free from pain. The discharge was noticeably less after the second treatment, and continued to grow less until, at the end of three weeks, it had become but a small stain on the pads. Bloody discoloration occurred only occasionally after the seventh treatment, and the patient slept exceedingly well, ate splendidly, and gained markedly in strength. She continued to gain generally until the latter part of March. At this time her weight had increased four pounds, she was walking about the sanitarium, and felt entirely comfortable. Suddenly she developed uræmic symptoms and failed steadily for ten days thereafter, when she died.

The beneficial results attributable to the rays in this case were the entire relief from pain and the gain in the general strength and condition.

From examination it also appeared that the growth had grown smaller on its superior aspect, but had encroached steadily toward the vulva. Several times during the course of the disease she exhibited phenomena of general systemic toxæmia.

CASE III.—A scene painter, aged forty-eight. Osteosarcoma of left superior maxilla, starting from a tooth socket from which the tooth had been extracted some two years previously. Came under treatment February 20, 1902. At this time a large portion of the maxilla and palate had sloughed away. There were three sinuses opening exteriorly, two on the cheek and one on the neck below the angle of the inferior maxilla. The discharge was profuse, and horribly fetid. The patient had been unable to leave his bed for three months; had been eating almost nothing, his weight had reduced from 230 to 140 pounds during the previous six months. He was in constant agonizing pain. Was unable to sleep without opiates and resorted to them constantly. The left side of the face was badly swollen.

His pain disappeared entirely during the first treatment and did not return for eight hours. After the fifth treatment the discharge had lessened about one-third, pain had entirely disappeared, and the patient was taking no more morphine. He had a good appetite, was taking nourishment well, and was sleeping, he said, as well as he ever did in his life. The swelling had been markedly reduced. His strength had increased so that he was having his clothes on an hour or two every day. He continued to improve for a month, when pieces of bone commenced to slough out; coincident with this there appeared a rise of temperature, accompanied by chills and great prostration. During the next month the patient was able to leave his bed and come to the sanitarium for treatment but six times. A month later, in the latter part of May, he died. During the last six weeks of his life masses of bone were constantly sloughing away, the amount of nourishment taken grew less and less, his strength steadily decreased; in short, he appeared to have died from general systemic toxæmia.

The beneficial results attributable to the rays in this case were complete removal of pain, which never returned after the fifth treatment, apparent arrest of the spread of the process, and marked improvement of the general condition during the first month.

CASE IV.—Carcinoma of the left breast. A tumor had been removed by some paste preparation two years previously and this was a recurrence. It had been removed again by the same paste and the sore had failed to heal, for which reason patient was sent to me for X-ray treatment. The tissues removed had been a mass about half the size of a small orange. When she came under treatment the excavation into the breast was

about one inch deep with raised inflamed, indurated borders. The breast was adherent to the ribs and there was considerable involvement of the axillary glands. Pain was constantly present. She came under treatment January 8, and was treated off and on until April 12, at which time she was prostrated by what was diagnosed by the attending physician as an attack of "rheumatism" in the muscles of the back and shoulders, and died in about three weeks.

After the first three treatments she had pain only at intervals until the attack which resulted in her death. The axillary glands had decreased considerably in size as had also the process in the breast, but at no time had the induration about the edges entirely disappeared, neither was there any sloughing observable. Her general condition, except in so far as relief from pain was concerned, did not seem to be changed at all during the course of the trouble.

There is good reason to believe that her "rheumatism" was due to septic absorption, with general toxæmia sufficiently pronounced to cause her death.

The only good results attributable to the application of the rays in this case were the relief of pain and the apparent arrest of the spread of the local lesions.

CASE V.—Sarcoma of the lymphatic glands of the left cervical region under and back of the angle of the jaw. Lesion had originally been sarcoma of the left parotid gland, for which total extirpation had been done. The tumor mass was about two inches in diameter laterally and one and one-half inches vertically. The patient's general condition was good, but he was in more or less constant pain, and the tumor had been increasing rapidly for two months previously. Patient came under treatment February 10, 1902.

For the first month the pain was very much lessened by the treatments, sometimes disappearing absolutely for several days, and the tumor became some softer and smaller. For the next month no change of any sort was discernible. At this time the tumor began to increase, the patient began to lose appetite, grow weaker, and lose flesh, and continued steadily to do so until along in June, when he died from exhaustion.

The beneficial results attributable to the rays in this case were confined to the partial relief of pain and arrest of progress of the growth during the first two months. After this, although the patient was rayed every day for a month, absolutely no beneficial results were discernible.

CASE VI.—Sarcoma of the left cervical lymphatics, as large as a small orange, below the angle of the jaw and extending down behind the clavicle into the mediastinum. A persistent right-sided sciatica also indicated that a malignant process was present in the deep abdominal glands, but no tumor was palpable in this situation. Cough, difficulty of swallowing,

and loss of appetite were present, and some loss in weight had been observed. Rotation of the head was interfered with. Was sleeping very poorly.

I commenced treating the neck and upper thoracic region every other day on February 21, 1902. By March 4 the tumor had reduced in size so that he could button his shirt collar together, whereas previously the ends would not come closer than three-quarters of an inch. Difficulty in swallowing had grown very much less, and there was very little interference with rotatory movements of the head. He was eating splendidly. From this time until April 19 the growth steadily diminished until it had become discoverable only on deep palpation back of the clavicle, and all of the pressure symptoms had disappeared. His appetite and general condition were excellent.

As the patient desired to attend to some business affairs at his home, I then released him from treatment, telling him to come back at the end of two weeks in order that I might treat the abdominal condition. Late in May I received a letter from his wife, stating that he had suddenly grown very much worse. He entered the sanitarium for resumption of treatment on the 30th of May. At this time he was unable to retain even water on his stomach. He was shockingly emaciated, and the pain in the right sciatic nerve was constant and harassing in the extreme. There was no apparent change in the cervical tumor from the condition observed when he went away, and the present desperate conditions had developed during the previous two weeks. For the next six weeks I applied X-radiance through the anterior abdominal and thoracic walls in such a way as to influence as much as possible the deep lymphatics. In the course of a week the pain in the right leg was much improved and at the end of the second week it was practically gone. He was taking nourishment fairly well, had been able to dispense entirely with morphine, and was feeling much better in every way. He also grew slightly stronger, so much so that he went out driving several times.

On July 17 I sent him into the country, intending to give him a two-weeks' rest from treatment. Five or six days after he began to fail in strength quite rapidly and a week later he died from exhaustion. There was no excessive temperature at the time.

The reduction in size of the cervical portion of the malignant enlargement in this case gives a striking illustration of the possibilities of X-ray therapy, but the ultimate result proved that the agent sometimes encounters insuperable limitations. The relief of the sciatica, increase in the ability to take nourishment, and the slight improvement in the general condition during the last course of treatment are proof that an influence

over the deeper malignant process was exercised, but it was not possible to render it profound enough to secure permanent benefit for the patient.

CASE VII.—A rapidly growing fibro-cystic sarcoma of uterus of about one year's standing. The transverse diameter was 8 1-2 inches and the tumor extended to a point three inches above the umbilicus. Laparotomy was done, tumor found to be inoperable, and patient sent to me for X-ray applications three weeks afterwards. She was treated for five weeks with apparently no result except a diminution of about 1 1-4 inches in the vertical diameter and 1 1-2 inches in the transverse dimension, and it is open to question as to whether this diminution was due to X-rays or to the cutting off of some of the nutrient vessels by the laparotomy. It is just as likely to have been the latter as the former.

Her stomach developed an almost absolute intolerance of nourishment and she died of exhaustion four weeks later.

CASE VIII.—Carcinoma of the uterus of four years' standing, bladder, rectum, and adjacent tissues involved, but no perforation present. Patient was in constant pain and profuse discharge was present.

She came under treatment May 8, 1902, and was treated every day for the next month. The only beneficial effect observable was a considerable diminution of the discharge. On May 26 her temperature went up to 102° F. and for a week thereafter she exhibited marked symptoms of general systemic toxæmia. Her pain was not influenced in the least, and it was necessary to keep her constantly under the influence of large doses of morphine. From the first her general condition grew steadily worse, and she died of exhaustion two months after first coming under treatment.

CASE IX.—Carcinoma of the uterus of three years' standing involving deep abdominal lymphatics. Patient came under treatment February 11, 1902, and was treated irregularly for two months thereafter. She then discontinued treatment and died three months later. In this case the pain and the discharge were markedly lessened, but no beneficial effect was observable. She was so irregular in her visits, however, that I do not look upon this case as a fair exemplification of the effects of the treatment.

The next group consists of four instances of cancer involving bony structures.

CASE X.—Epithelioma of the left orbit involving the nose. Patient was suffering pain constantly and was unable to breathe through the nose. There was at times a profuse bloody discharge from the nose and the eye had been considerably extruded from the socket upwardly and outwardly. The pain was lessened by the first treatment for several hours, and after the third treatment relief from pain was permanent. After

five treatments he could breathe through his nose and the tumor was reduced so that the eye had gone back considerably to its normal position. He was under treatment for ten weeks, when he discontinued for some reason unknown to me, and I lost track of the case. The complete cessation of pain and the improvement in the nasal condition indicated that actual improvement was being secured upon the growth itself, and this was confirmed on examination by the specialist who referred the cause to me.

CASE XI.—Osteosarcoma of the superior maxilla, recurrent after operation. Patient came under treatment May 20, 1902, at which time he was suffering from pain constantly, which kept him from sleeping, had little appetite, and had lost some flesh. Up to the present time has been treated about three times a week. Has been practically free from pain since the 1st of June. On July 1 he was taken with chills and fever. This was soon followed by the formation of an abscess, which evacuated spontaneously into the mouth after a few days. During this time he was prostrated, had repeated chills and fever, and spent most of his time in bed. About eight days later a sinus opened in the neck just below the inferior maxilla, and has discharged at intervals since that time. After recovery from the systemic toxæmia occasioned by the formation of the first abscess his general condition improved, and since then he has been eating well, sleeping well, feeling well, and attending to his business again. The outlook in this case is hopeful.

CASE XII.—Patient aged seventy-nine years. Epithelioma affecting the lower jaw, chin, and lower portion of the cheek on each side. Patient was suffering pain constantly. General condition very poor. He has received twenty-three treatments, with apparently no beneficial results except a marked amelioration of the pain. His general condition appears to be growing slowly and steadily worse, but I cannot perceive that the area of the disease has increased at all since he came under treatment.

CASE XIII.—Condition almost identical with the above except that the patient was fifty years old instead of seventy-nine. He took three treatments and then discontinued without explanation. No effect was apparent from the three treatments, not even relief from pain.

The results in these cases indicate that, as would be inferred, cancer involving bony tissue responds much less readily to X-ray therapy than when the soft tissues are affected, even though the process may extend deeper in the latter case.

The third group includes nine cases of intra-abdominal cancer.

CASE XIV.—Carcinoma of the uterus, involving the vaginal vault and deep abdominal lymphatics, of three years' standing. First came under treatment April 5, 1902. At this time

patient suffered pain constantly. Had profuse exceedingly malodorous discharge. General condition poor and rapidly growing worse.

During the following three months she was rayed every other day. She then discontinued treatment. Up to that time there had been spasmodyc evidences of improvement in the way of temporary relief of pain, lessening of discharge, etc., but on the whole her condition did not appear to have changed. She was, however, no worse than when treatment was instituted, and an inhibitive influence had apparently been secured upon the malignant process.

CASE XV.—Carcinoma of the uterus, also probably involving the deep abdominal lymphatics, of eighteen months' standing. Patient came under treatment February 20, and for the next six weeks received twenty-one treatments. She then discontinued without explanation. In this case no change was observable in either the symptomatic phenomena, the discharge, or the growth itself. As the patient was growing steadily worse when she came under treatment, it is reasonable to suppose that an inhibitory influence was also secured in this case.

CASE XVI.—Carcinoma of the uterus, involving bladder and vaginal vault. Patient first came under treatment June 29, 1902, and has received thirty-two treatments. She was growing rapidly worse when she came under treatment, and there have been spasmodyc evidences of improvement in the way of lessening of the discharge, cessation of hemorrhage, and relief of pain. Up to the present time these intervals of improvement have not lasted more than four days each, when there has been another accession of sinister phenomena. This patient is still under treatment, hence conclusions as to the ultimate destiny of the case are at the present time impossible.

CASE XVII.—Carcinoma of the uterus, involving the vaginal vault and deep abdominal lymphatics. Patient suffered constantly from pain, and had severe hemorrhages every few days. General condition exceedingly poor. From May 8 to May 22 was treated eight times. She then discontinued without explanation. During this time her hemorrhages became very much less, her pain was relieved somewhat, but the time, of course, was too short for her general condition to show much change. I have since heard, however, that some benefit followed the course of treatment which she received.

CASE XVIII.—Rapidly growing carcinoma of the uterus with extensive involvement of contiguous tissues of about two years' standing. Patient suffered intense pain and had severe hemorrhages. General condition very poor. She received three treatments with apparently no effect whatever, and discontinued.

CASE XIX.—Malignant disease of the pyloric end of the

stomach in a man sixty-eight years old. First came under treatment February 18, 1902. Was then suffering from constant and excruciating pain, unable to sleep or take nourishment, and his general condition was very poor and rapidly growing worse. After the second treatment he slept all night without any opiate for the first time in many weeks, and the soreness present on deep palpation was much lessened. He has been under treatment about three times a week since that date, and has been able to take judiciously chosen nourishment nearly all that time. Pain steadily lessened until about six weeks ago, since which time it has been practically nil. Soreness upon deep pressure is apparent only in two spots and his general condition is considerably better in every respect than when he came under treatment. The outlook in this case appears to be hopeful.

CASE XX.—Fibro-sarcoma of anterior abdominal wall, recurrent after extirpation of uterus and ovaries for the original growth, which started in the uterus. Diagnosis microscopically confirmed. She first came under X-ray treatment January 28, 1902. At this time the lateral diameter of the tumor was ten inches and the vertical diameter eight inches. Growth had been increasing rapidly for the previous three months, and at this time was of a stony hardness throughout. After the third treatment it was observed that the tumor had become markedly softened in spots, in one place apparently to the depth of an inch or more, and the skin, which before had been firmly fixed to the tumor, had now become movable over a considerable portion of its area. Sensations of pressure and discomfort which were markedly in evidence when she came under treatment had greatly lessened and the patient expressed herself as feeling much better. Since that time she has received eighty-five treatments. There has been a slight diminution in the size of the tumor. Patient has no sensations of discomfort or pressure and feels so well that she is returning to her position as a school teacher this month.

In this case the rays have unquestionably inhibited the malignant progress of the tumor up to the present time, and the future history of the case is to be regarded with very great interest. Even if we cannot remove these tumors it will be an achievement of inestimable value if we are able in some cases to inhibit further development of the malignant tendencies.

CASE XXI.—A growth in the neighborhood of the left broad ligament, said to be malignant and inoperable by a surgeon who did an exploratory laparotomy, but no microscopical section was made. It was accompanied by ascites, which accumulated rapidly, to the extent of two or three gallons, necessitating frequent tappings. No pain was ever present, but the growth was exquisitely sensitive upon palpation. Patient came under treatment January 27, 1902. Three days after

two gallons of fluid were withdrawn from the abdomen through a cannula. During the next month she was given eleven X-ray treatments. The soreness on palpation was markedly lessened and her general condition improved considerably. She was then tapped again, removing a gallon and a quarter of fluid. Examination after tapping, however, indicated that the growth had encroached upon the right side of the pelvis in a position where it was not evident a month previously. Her weight was 128 3-4 pounds. X-ray applications were continued about three times a week for the next two months. Fluid did not increase to any great extent during this time. Patient continued to feel better and better generally. She was now able to ride in a carriage without suffering pain from the jolting. Her weight increased to 140 1-2 pounds. Up to the present time she has been rayed on an average of three times a week. The fluid has not reaccumulated. The tumorous mass, as far as examination will show, seems to have decreased in size, and her general health is excellent.

In this instance the inference that the growth and malignant tendencies of the disease have been inhibited, at least up to the present time, seems justified.

CASE XXII.—A nodulated palpable tumor, probably sarcomatous, situated deeply in the lower lumbar and upper sacral regions. Patient first came under treatment February 3, 1902. At this time pain was constantly present in the small of the back and in the right sciatic nerve. Tumor was characterized by exquisite tenderness upon deep palpation. Two treatments completely removed the sciatica and markedly lessened the backache. After a dozen applications the pain in the back caused her very little trouble, and the soreness upon palpation was only evident when firm pressure was made. Up to June 7, a period of four months, she received thirty applications of the rays. She was then practically free from pain and the tumors had decreased in size so that they were no longer palpable. At this time she was operated upon for a tubal pregnancy, and the surgeon who operated, and who had referred the patient to me in the first place, informed me that examination of the original malignant mass at the time of operation demonstrated that three nodules about the size of a pea were all that was left of the lesion. The future history of this case is also pregnant with interest.

The fourth group is constituted by a series of ten mammary cancers.

CASE XXIII.—Cancer of the right breast. Recurrent after operation, involving the axilla, the supra-clavicular lymphatics, and the pectoralis major muscle. Characteristic pain, following the distribution of the lower lumbar nerves, which had been present for several months and resisted treatment addressed to its relief, also indicated that metastases existed in

the deep lymphatics of the trunk. Her general condition was very poor. Emaciation pronounced. Came under treatment first March 26, 1902. Up to the present time she has received sixty treatments directed alternately upon the breast and the deep lymphatics of the trunk through the anterior surface of the body. The enlarged glands in the neighborhood of the clavicle and the mass of pathological tissue in the axilla and the pectoralis major muscle have entirely disappeared. She has had no pain in the back for the last eleven weeks, and her general condition has steadily improved. She has gained ten pounds in the last two months. Present appearances indicate that this woman has been entirely cured of multiple recurrent cancer of considerable extent.

**CASE XXIV.**—Scirrhus of the left breast of two years' standing. The chain of glands leading to the axilla and the axilla itself were extensively involved, forming an oblong mass one inch in diameter and three inches long. Constant cough and bloody expectoration indicated involvement of the bronchial lymphatics. Patient first came under treatment March 22, 1902. Since that time she has had forty-four treatments. The mass in the breast has diminished at least twenty-five per cent. The axillary end of the oblong tumor referred to has receded apparently about three-quarters of an inch, but no change has apparently taken place in the mass of indurated glands at the lower border of the pectoralis major muscle. Cough and expectoration have diminished somewhat, but are still present. The pain, which was constantly present when she first came under treatment, had also diminished considerably.

In this case, which has now been under treatment five months and in which the tumor was growing rapidly when she consulted me first, there has evidently been secured a stay in the progress of the disease, and the decrease in the dimensions of the tumor and the symptoms which indicated bronchial involvement lead me to hope that we may be able to carry these results considerably further.

**CASE XXV.**—A malignant process in the right breast, adherent to the ribs with an ulcerated area at the junction of the breast with the trunk, and a slight involvement of the axillary glands. Patient aged sixty-eight. First came under treatment June 15, 1902. Since then has had eighteen treatments, with complete healing of the ulceration as a result. The indurated masses in the axilla and in the breast have softened and decreased in size. Pain has been greatly lessened and the patient's general condition has improved.

**CASE XXVI.**—Small hard nodule in the left breast about the size of a walnut, with retraction of the nipple and induration of the axillary glands, of about six months' standing. Patient is sixty-six years of age. First came under treatment May 7,

1902. From that time until June 7 she received fourteen treatments, when a severe X-ray dermatitis developed and it was necessary to suspend applications until August 2, when they were resumed.

At the present time there is no pain in the breast. The nodule has decreased about fifty per cent. in size. The axillary enlargement has nearly disappeared, and the patient appears to be progressing toward complete recovery.

CASE XXVII.—Epithelioma of the left breast, starting at the nipple, consisting of a horny induration and thickening of the skin in the immediate vicinity, with a mass in the breast about as large as an English walnut and enlargement of the axillary glands, of ten months' standing.

Patient first came under treatment April 2, 1902, since which time she has received forty applications. Now the axillary enlargement has decreased in size about fifty per cent. and the mass in the breast has decreased in size, but there has been no change in the horny induration of the skin, in spite of the fact that I have twice induced a moderately severe dermatitis. The patient's general condition, which was poor when she first came under treatment, has improved greatly. She now suffers no pain, and it appears reasonable to suppose that we have at least secured a stay in the malignant progress of the disease.

CASE XXVIII.—Cancer of right breast, involving the axillary glands. Had had an indurated mass removed from the same breast by a plaster two years previously. First came under treatment March 17, 1902, at which time in addition to the mass in the axilla there were palpable three distinct indurated masses in the breast itself. She has received fifty treatments altogether, and at the present time nothing is discoverable of the axillary enlargement, one of the three original masses only is discoverable in the breast, and this has decreased apparently about fifty per cent.

CASE XXIX.—An induration in the chain of lymphatics along the lower border of the pectoralis major muscle, flattened in shape, and about the size of half a dollar. Also two small indurated glands in the infra-clavicular region. Breast and axillary glands were removed two years ago for cancer. First came under treatment August 2, and has had ten treatments. The enlarged glands under the clavicle have entirely disappeared. The indurated mass at the lower border of the pectoralis major has resolved itself into two masses each about the size of a pea, and the patient appears to be getting well.

CASE XXX.—Cancer of the right breast involving axillary glands. Patient first came under treatment January 20, 1902. At this time she was suffering constant pain, and the growth had been increasing rapidly for two months back. She re-

ceived fourteen applications, and discontinued without explanation. At that time the tumors in both breast and axilla had decreased slightly in size and the pain had nearly disappeared. I met her six weeks later and she told me that she was getting better, and was not going to have anything more done. I am not aware of the subsequent history of the case.

CASE XXXI.—Primary scirrhouc cancer of the left breast, with indurated axillary enlargement. As the tumor was large, about the size of a small orange, and freely movable, I advised operation, to be immediately followed by the application of the rays. To this the patient consented, and the breast was extirpated, together with the axillary glands, on August 13. The rays were first applied on August 16, and the patient is still under treatment. I shall watch her future history with interest.

I will say here that microscopical section of the tumor after removal demonstrated that it was a fibro-sarcoma. A point of some interest in connection herewith is that, in spite of the large size of the tumor and the fact that it had been growing about three years, it was not adherent to the ribs and there was not the slightest retraction of the nipple. Another fact worthy of note is that the patient is but thirty-one years old.

CASE XXXII.—Cancer of left breast, recurrent after extirpation for the same trouble three years previously, in cicatrix. The patient was treated twice without any apparent effect, and discontinued without explanation.

CASE XXXIII.—Round-celled sarcoma of the neck of about three years' standing. Tumor involved an area of ten by seven inches, with an ulcerating surface of 5 by 3 1-2 inches, which was eroded to the depth of an inch in one spot and not less than half an inch anywhere. There was considerable involvement of the adjacent lymphatic glands. Patient was suffering excruciating pain constantly. He first came under treatment November 20, 1901. During the next seven weeks he received seventeen treatments. The first treatment relieved the pain very appreciably, and after the sixth it disappeared permanently. Evidences of reparative action began to appear after the fourth treatment, and at the expiration of the seventh week the sore was entirely healed, the patient was entirely comfortable, and had returned to his work. At the present time a contraction of the scar has induced a partial paralysis of the recurrent laryngeal nerve, and has also involved the facial to a considerable extent, but no evidences whatever of recurrence are or have been present at any time since the sore became healed. I am happy to be able to make this last statement in public, because a report has been circulated upon several occasions that the disease had recurred in this case and that the patient was worse than ever.

The results upon the malignant process in this case are particularly noteworthy because of the extreme rarity with which sarcomas of the neck are overcome by any method of treatment. Dr. William B. Coley of New York, whose large experience with malignant growths clothes his statements with authority, says that he has never seen a case of sarcoma of the neck cured by operation, and has not been able to find an authentic case reported by other surgeons. He says further in this connection, "If in the X-ray we have a means of destroying these growths, or a certain proportion of them, it means a great advance over present methods."

The clinical data of these cases may be summarized as follows:

Complete disappearance of the malignant process has apparently been secured in 3 cases; permanent reduction of tumor in 13; temporary reduction with subsequent increase in 1; permanent arrest only of growth in 2. There was no effect positively demonstrated upon the size of the lesions in 14.

Complete permanent relief of pain was secured in 14 cases; complete temporary relief in 2; partial relief in 8; no relief whatever in 4; and in 5 there had been no pain.

The general condition of the patient was permanently improved in 11; temporarily improved in 8; not influenced at all apparently in 8; and in 6 the general condition was not noticeably impaired when the patient came under treatment.

A gain in weight was evident in 6; no influence apparent in 27.

Hemorrhage was lessened in 8; uninfluenced in 1; and in 24 there had been no hemorrhage.

Evidences of systemic toxæmia were noted in 14.

In 5 cases there were discernible no evidences of benefit whatever. As 3 of these patients discontinued treatment after two or three séances, however, this statement can properly be applied to but 2 of them.

(*To be concluded.*)

## X-RAY AS A MEANS OF DIAGNOSIS AND AS A THERAPEUTIC AGENT, WITH A REPORT OF CASES.

BY RUSSELL H. BOGGS, M. D., ALLEGHENY, PA.

Since the discovery of Roentgen rays there has been a steady and marked advancement of both X-ray apparatus and technic, until at present the rays are used not only as a means of diagnosis, but also for the treatment of a number of chronic and, heretofore, almost incurable diseases. Many cases of carcinoma, lupus, eczema, psoriasis, acne, syphilis and other diseases have been cured. Nor is radiotherapy confined to exterior conditions, but tuberculosis and carcinoma of the internal organs have been benefited as well. In most of these cases pain has subsided after a few treatments.

X-ray is a therapeutic agent whose value is very much underestimated on account of the lack of sufficient knowledge on the subject, especially the nature and character of its force and methods of application. It is just as essential to know the dosage of the rays as it is to know the dosage of a drug before prescribing it.

X-ray has a wide range in therapeutics, as a light can be modified by raising or lowering the vacuum in the tube and by changing the amperage going through the coil.

Dr. Prescott's destruction of germ life in eggs by the rays is very interesting, and shows the absolute necessity of selecting the proper vacuum in the tube for each individual case. He varied the vacuum, but could only destroy the germ life when the proper degree was reached. The same holds good in radiotherapy, and incorrect technic is the cause of a large number of failures.

The bacilli of cholera, diphtheria, influenza, glanders, anthrax, and pneumonia have been destroyed by continued exposures. I have been treating a number of cases of lupus of different parts of the body, and a few cases of carcinoma, eczema, and pulmonary tuberculosis. One case of consumption, treated nearly six months, I can report cured. Cough and night sweats stopped, and the patient gained considerably in flesh and strength. The diagnosis was confirmed by two of our best physicians in Pittsburg. It is now nearly four

months since she had her last treatment. Every case of tuberculosis so far has shown a decided gain, some more than others, but each enough to give decided credit to the X-ray treatment.

All cases of lupus and epithelioma respond readily to the rays. In most of these patients it is only necessary to produce a slight dermatitis, and in some this is entirely unnecessary. Begin treatment with a radiance of low intensity, continue increasing as the case may require, remembering that you are storing up rays which have a cumulative effect.

Radiotherapy affords great relief from pain in all forms of carcinoma, and for this reason as well as because success has been attained where the outlook has otherwise been hopeless, all inoperable cases should be treated. After operation for removal of cancerous growths, every patient in the near future will be treated to prevent recurrence, as no matter how carefully the surgeon has done his work, there is often a minute particle left. With the X-ray treatment following operations the mortality will be greatly lessened.

When large tumors are present in regions where the mass can be removed successfully, it is always advisable to remove it before X-ray treatment, as it lessens the danger of sepsis during the degeneration which takes place in treating large carcinomatus growths. The earlier the case can be treated by X-ray after operation, the better.

So far in the history of medicine no other method of treatment can be compared to radiotherapy except the Finsen light.

The question of the value of X-ray in the diagnosis of certain lesions seems to be a settled fact, and it is without doubt so far beyond the experimental stage that every intelligent physician is compelled to employ it in his practice. In all cases we should employ every known means to arrive at an early and accurate diagnosis. Therefore the use of the X-ray should receive serious consideration. Its use has been made difficult and unsatisfactory by reason of lack of skilled operators in the medical profession. Physicians have been slow in taking up this class of work, and this is on account of the popular belief that it does not require an expert who is a graduate in medicine to obtain good results. Of course, the experience of physicians when depending on non-professional operators has been very unsatisfactory, unless it was in some very simple cases. In a number of hospitals all

over the country, when they make an examination the head nurse or some inexperienced party is called to operate the X-ray machine. They might just as well call one of these parties to do a laparotomy or an amputation.

A full knowledge of radiotherapy and radiography cannot be acquired in a day, but only by months of hard and careful study. It is absolutely necessary for every X-ray worker to keep in touch with his co-workers both in this country and abroad. Ever since the discovery of X-ray there have been many investigators in all parts of the world, and it has been by their working together that such wonderful results have been achieved.

In order to do successful radiographic or radiotherapeutic work the operator's technic must be perfect. It is essential that he should have a thorough knowledge of his apparatus, the Crookes tubes, and other accessories and the management of the same, and know how much X-rays are being produced. The capacity of the machine must be known. If the coil is used, the amperage, voltage, and number of interruptions, and if a static machine, the size and number of plates and their speed must be known. I use both the coil and static machine, but a static necessitates slightly longer exposures. The tube, which is the most important part of the apparatus, must be handled carefully, and unless the operator is familiar with it and able to detect the slight changes likely to occur during operation, he cannot expect to attain satisfactory results; both fluoroscopic and radiographic examinations are necessary, and the results of one confirms the other. Every case should be examined with the fluoroscope except the hip joint and abdominal cases, in which good results are obtained only by the radiograph. The examination by the fluoroscope will not compare with a radiograph, as a picture will reveal so much more, besides being a permanent record. A radiograph is accurate when correctly interpreted.

The interpretation of a radiograph requires considerable experience, besides a thorough anatomical knowledge of the normal part. Without this the surgeon might diagnose an epiphyseal separation as a fracture, and by so doing bring discredit on the use of the rays. The radiograph is to the surgeon what the architect's drawing is to the contractor. To secure good radiographs the operator must develop his own

plates, for he understands under what conditions the exposure has been made and what he wants to bring out on the plate, while a photographer would be compelled to work according to set rules. In many cases the operator seems to be satisfied when his radiograph shows the mere outline of the bone, whereas it should show the medullary canal and structure as well. It will be readily seen that with such a radiograph diseases and fractures of bones can be easily diagnosed.

In the normal thorax picture, the first thing we notice besides the ribs is the shadow cast by the heart and mediastinal contents. The shadow of the liver and diaphragm appears, but is usually blurred by the respiratory movements.

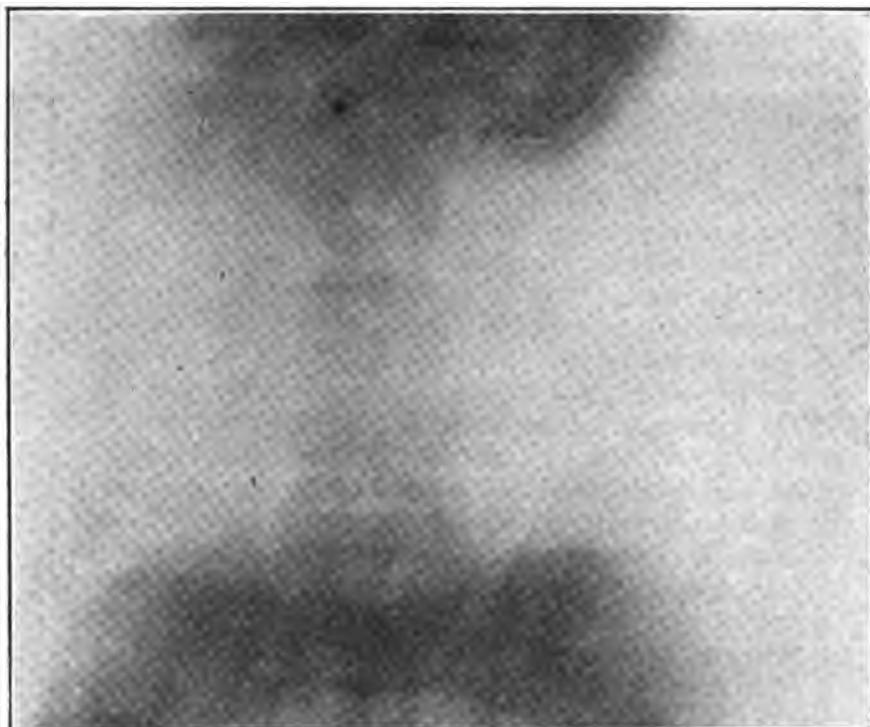
To examine the chest thoroughly the X-ray must be used, and the result is much more accurate than that obtained by percussion. As stated before, both fluoroscope and radiograph should be used. Percussion may show enlargement of the left side of the heart, when the symptom is only due to the organ approaching nearer this side of the thorax than normal, the error being caused by too little lung tissue between the heart and chest wall. The rays should be used for determining existing conditions and the progress and extent of the disease in all cases of pulmonary tuberculosis. By the employment of such means the physician can arrive at the correct conclusion much sooner, and oftentimes, the early warning contributes to prompt and hopeful treatment.

A good radiograph of the head shows the inner and outer table, sphenoid-maxillary, vomer, and nasal bones, antrum of Highmore, frontal sinus, and the roots of the teeth. From the above you will readily see that unerupted teeth, abscess, fracture, and foreign body in any part of the cranium can be made visible.

A radiograph of the spine and pelvis shows every articulation plainly, and the foramina in the sacrum for the passage of the anterior spinal nerves. The outline of the psoas muscles, kidneys, and intestines are usually seen. Every case of biliary, renal, and vesical calculi should be radiographed before an operation is decided upon, and when a calculus appears to show in the picture it should be verified by another plate. The calculi are not only diagnosed, but size, number, and position are shown, and therefore the surgeon not only has a correct diagnosis, but is greatly aided by being able to decide

upon the operation suited to each particular case. He can perform his operations with the least possible injury to the surrounding tissues.

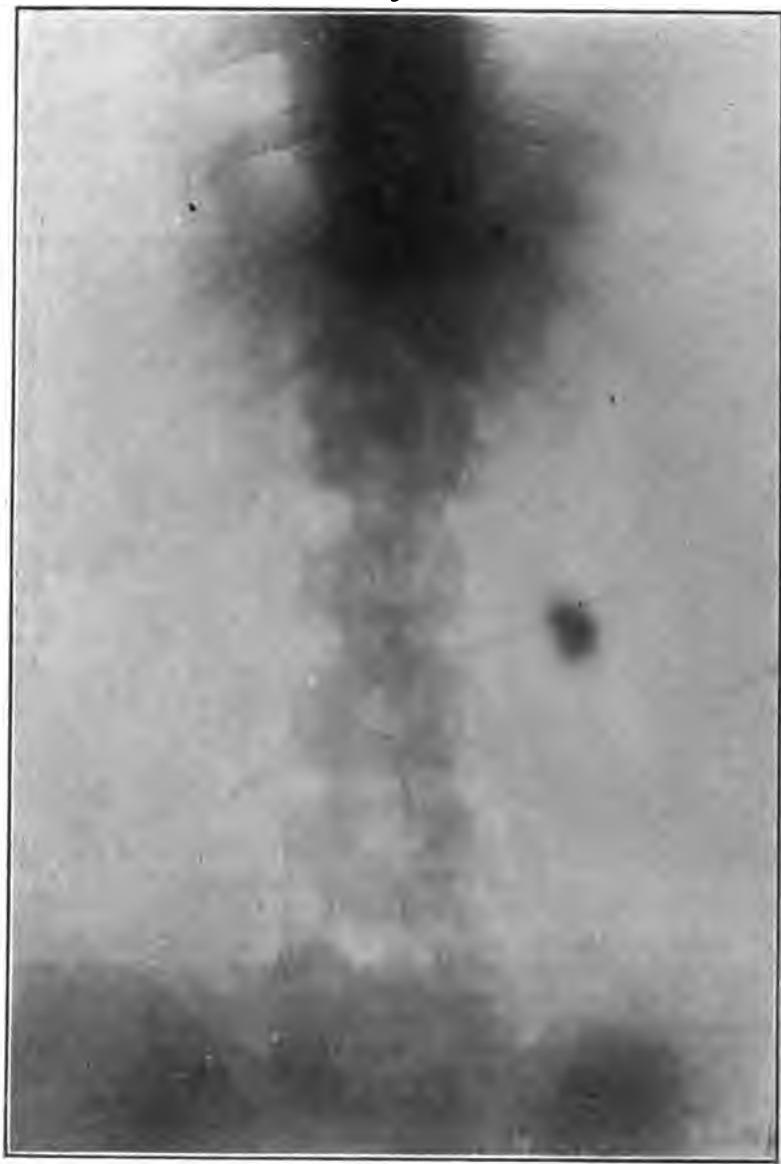
In this connection I will report a few illustrative cases.



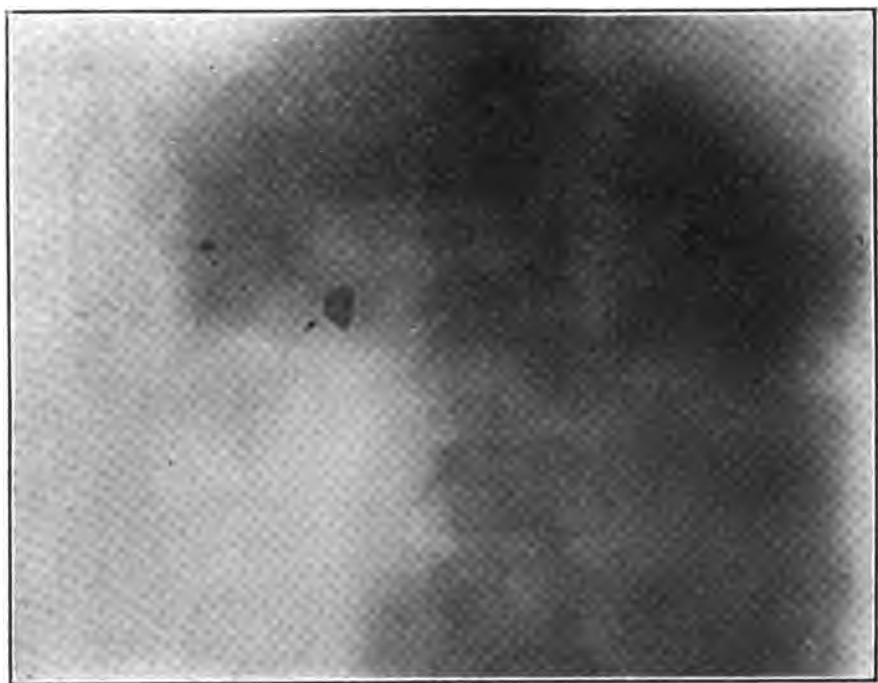
Case I.—Stone in the Pelvis of the Kidney.

CASE I.—Mr. E. B., a roller, large, powerful and well-nourished, had suffered with pain in the right side below the arch of the ribs for ten years; at times he was compelled to take large doses of morphia and was unable to work for many days. His pain was always increased when riding on trains or street cars; and from other symptoms it was a question of diagnosis between renal calculi and floating kidney. He had been to a number of physicians, and only two pronounced his case renal calculi. A Roentgen-ray photograph showed a stone in the pelvis of the kidney.

CASE II.—Mrs. D., aged thirty-five, had suffered for years with a floating kidney, which had been diagnosed by ten or fifteen physicians. From her symptoms several of the physi-



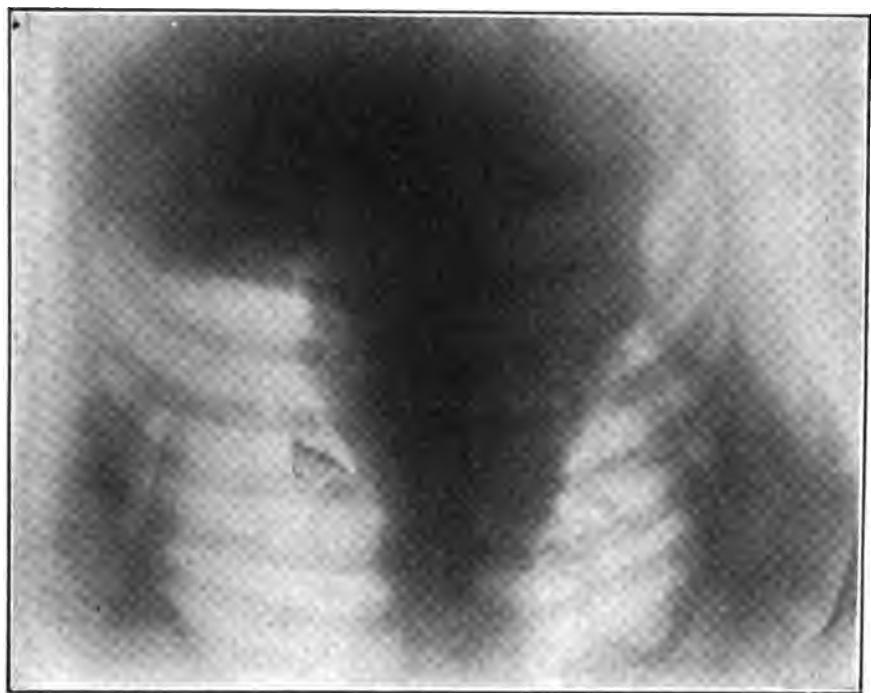
**Case II.—Stone in the Kidney.**



**Case III.—Gall Stone.**

Case IV.—Aortic Aneurism.





**Case V.—Solid Spot on the Lung.**



**Case VI.—Safety-pin in Esophagus.**

cians suspected a tubercular kidney as well. A radiograph showed a stone in the kidney. Her physician, Dr. Huggins of our city, who referred these cases to me, operated and successfully removed the calculi in both cases, thus verifying the radiographs.

CASE III.—Referred by his family physician, Dr. McCready, with the following history: Mr. H., a painter, had repeated attacks of colic. The last time commenced with lead colic, having the characteristic symptoms, blue lines on the gums, and obstinate constipation. After the usual treatment he was relieved and was about to return to his occupation, when he was seized with another very severe attack, which simulated biliary colic. The blue lines on his gums had disappeared, and his physician felt certain that the trouble was due to gall stones. Every stool was examined for a period of four weeks, but no stones were found. A radiograph showed stones in the gall bladder.

CASE IV.—This, a case of aortic aneurism, has been to a number of physicians as well as to Johns Hopkins University, where they used the gelatine treatment with no decided benefit. His physician, Dr. McGrew, wanted the radiograph to ascertain whether the aneurism was sacculated or fusiform, as, if sacculated, he intended to needle it. The radiograph showed the aneurism to be fusiform.

CASE V. Mrs. B., family history good, has been coughing and having night sweats at times for the last two years. Two weeks before the radiograph was made, she expectorated half a pint of blood. It was a question whether the blood came from the lungs or stomach. The radiograph showed a solid spot in the right lung.

CASE VI.—This case, a child two years of age, was referred to me on account of the difficulty of deglutition, and vomiting, which had continued for some two days. The mother suspected that the child had swallowed some foreign substance. The X-ray examination showed an open safety pin in the child's esophagus near the cardiac orifice. The pin was removed by Drs. Ferree, McCready, Stybr, and Russell of this city.



**CLARENCE EDWARD SKINNER, M. D., LL. D.**

## **Editorial.**

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### **THE TWELFTH ANNUAL MEETING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSO- CIATION.**

THE success of the meeting of the American Electro-Therapeutic Association, which closed on September 4, in many important features reflected credit upon the Executive Council, the Committee of Arrangements, the ladies who afforded evening entertainment, and the management of the Hotel Kaaterskill. No more suitable and attractive place could have been chosen—removed from the din and allurements of the town—in which a body of scientific men and women could meet for mutual enlightenment. To this the large attendance at the sessions and the interesting character of the discussions fully attested.

It is a notable fact that the subject of the application of the X-ray to therapeutics was accorded a greater part of the attention. Probably no body of physicians are so well qualified to consider the scientific employment of the X-ray in medical practice as those who have devoted years to the study of electro-therapeutics.

The papers were practical, scientific, and marked by a degree of conservatism which will go far to set the pace for the future employment of a most valuable means of coping with many heretofore incurable conditions. It was universally conceded that in the treatment of cancer the X-ray must in the future play an important part in the treatment of every case, operable or inoperable.

That large tumors should be first removed by the knife is the acknowledged opinion, but that the employment of the X-ray must immediately follow, and may wisely precede, the operation is also imperative. It is a notable fact that already a uniformity of opinion is prevalent in most matters pertaining to the technical employment of the X-ray. The high vacuum tube is deemed indispensable in the treatment of all except superficial processes. As a rule, short (ten-minute) exposures upon every second day are to be preferred to long and more frequent applications. The presence of a com-

mencing dermatitis is an indication to rest treatment until it disappears. All patients should be instructed to expect a dermatitis of the first degree and possibly of the second degree, at some time in the treatment of every case, and misunderstandings and litigations will then be avoided. Screens should be generally employed, especially about the face, care being taken not to screen tissues too near the margins of cancerous processes. The results already obtained and general unanimity of opinion expressed give great assurance for the future of the X-ray as a means resourceful and promising for the relief of suffering humanity. A paper showing excellent results from electricity in the treatment of rheumatoid arthritis called forth a discussion, demonstrating that, at least, a few are succeeding in the treatment of this distressing affection, which so many, recognized as authorities, profess to rate as incurable. That the future has better things in store for many of these sufferers, when the profession becomes more generally enlightened, is gratifying. New devices and apparatus were presented for consideration, which will be published in the subsequent issues of this journal.

The preliminary report of the Committee on Nomenclature, which will also be published in an early issue, is the result of the labor of men whose standing is an assurance of its scientific value.

The chief of the Department of Electricity of the Exposition to be held at St. Louis, was present in behalf of a movement for having an electro-therapeutic exhibit inaugurated under the auspices of the department over which he presides. The matter was cordially received and favorable resolutions adopted.

Before adjournment it was resolved that the next meeting of the Association should be held at Atlantic City some time during the month of September, 1903.

## Progress in Physical Therapeutics.

### DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D.

*The Use of Electricity in the Treatment of Habitual Constipation.*  
By Dr. Sigismund Cohn, New York Medical Journal,  
September 6, 1902.

The author begins with his definition of habitual constipation and understands by it an independent disease due solely to an atony of the muscular coat of the bowels, contrary to the other forms of constipation, which are more of a secondary condition as a consequence of abnormal conditions either in the intestines or other organs of the human body.

Therefore the indications to be met in the treatment of habitual constipation will be to remove the atonic condition of the bowels.

While mechano-therapy is generally agreed upon to accomplish this result, most of the clinicians prefer massage, gymnastics, and hydrotherapy to electricity. It is the object of the author to establish by the reports of cases in this paper the value and importance of electricity in the treatment of habitual constipation.

The currents used by him are the galvanic, faradic, sinusoidal, farado-galvanic, and static. While he makes use of all of them, he prefers to start the treatment with the static. The static electricity is used by him either in the form of the wave current or the static induced current; the first in the milder forms of constipation, the latter in the very obstinate cases of long standing.

In using the static wave current the patient is in contact with one pole only, while the other one may be grounded or not. Used without grounding the treatment is a very mild one. Grounding makes the current considerably stronger. The contact with the patient is made, either by the rectum (the patient sitting on the upright rectal electrode), or by the abdominal walls (tin-foil plate, 8 x 10). The current's strength is regulated by the spark-gap between the sliding poles.

The static induced current enables one to use very powerful means without causing the patient any pain.

The whole strength of the current concentrates itself between two points of the body, in contrast to the static wave current, where the strength of the current is distributed over the entire body. The patient is connected with the outer surface of the Leyden jar, while the inner surfaces are connected with the abdo-poles of the machine. One electrode is generally on the abdo-

men, the other one either in the rectum (direct) or on the back (percutaneous). The current's strength is also regulated by the spark-gap. As the patient need not be insulated, we can also use the labile method.

Both of these currents can be made to act more powerfully by a mode of administration called the undulating or swelling current. This means a current that, starting from zero, gradually swells to a maximum of strength, and returns in the same way to zero. By alternately increasing and decreasing this current, one produces in the muscles alternations of wave-like contractions and relaxations. The effect of this mode of administration of the current is a tonic exercise of the muscles, and there is no danger of exhausting the muscles, as the maximum contraction is only of short duration. On the static machine one gets the swelling current by slowly removing one pole from and then approaching to the other.

Next to the static the author likes to use the sinusoidal, as he has seen very good effects follow its use. The galvanic current he uses only in the form of hydro-electric treatment, and prefers the flexible electrode as recommended by Boas, to the hard rubber type.

Of the 16 cases reported by the author 3 showed no improvement, but the author was able to give reasons for his failure. Four cases, while largely improved, were not as yet so far finished as to permit of any definite conclusion. The remaining 9 cases were a decided success, as most of them have been examined after a year had elapsed from time of treatment, and had not relapsed.

In the treatment of some of the patients, who were quite stout and had relaxed abdominal walls, the author was able to observe some interesting facts.

Measuring the abdominal circumference at the navel, and weighing them before and after each treatment, he always found a reduction in the abdominal circumference as well as in the weight of the body. The author explains this loss in abdominal circumference by the fact that the powerful contractions of the abdominal muscles leave these muscles, right after the treatment, in a state of improved tonicity (less flabby and more contracted). The consequence is that these muscles are able to offer more resistance to the internal abdominal pressure; therefore the capacity of the abdominal cavity will be reduced and the circumference become smaller.

The loss of weight is explained by the loss of H<sub>2</sub>O and CO<sub>2</sub>. Electrical and especially static currents produce hyper-hydrosis, and the greater elimination of CO<sub>2</sub>, is explained by the increased work done by the muscles.

In his conclusions the author states that: (1) Electricity should not be employed as a last, desperate chance after all

other means have failed, but should be given a front rank in the treatment of this disease. (2) Especially the static currents, with their powerful vibratory effects, should be employed more frequently than has been done heretofore. (3) The reduction of abdominal circumference by the use of these currents is a proof of their tonic influence upon the abdominal muscles. (4) The most powerful means of obtaining this tonic condition is the administration of the swelling or undulating current.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D.

*A More Rational Method of Passing the Suture in Fixation of the Kidney.* Max Brodel, American Medicine, Philadelphia, August 2.

He recommends the method of fixation of the kidney by a triangular suture not parallel to the frame-work of the cortex, but at right angles to it, and in such a manner as to leave two suture bridges on the kidney, which bear the brunt of the strain and traction, instead of being borne by the circulatory or secretory structures of the kidney. To make their suture tear out, the bridge must tear the fibrous capsule into the cortical substance of the kidney a procedure requiring considerable force.

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*Anuria; Clinical Memoranda in the Observation of a Case.* Alexis F. Moschkoquitz, Medical News, New York, August 2.

After reporting a case with full details, the general condition is discussed. The symptoms seem to have been attributed first to malaria and were misleading, as shown by the operation. The left kidney not containing calculi was obstructed, while the right was represented merely by a mass of cicatricial tissue containing in its center a small mass of pus. It was a case of anuria in a patient with an absolutely non-functionating right kidney, the left kidney being hydro-nephritically dilated, due to a downward displacement of the organ resulting in such bending of the ureter as to completely interfere with the passage of urine.

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*Total Obstructive Urinary Suppression.* W. Mitchell Stevens, British Medical Journal.

The following facts are made:

(a) There was a history of prolonged and well-marked glycosuria. (b) A very short history of symptoms leading to

renal calculus. Three months before death there was absolutely nothing to suggest kidney lesion of any kind. (c) The onset of total suppression of urine without symptoms of renal colic. (d) The suppression was absolute. Not a drop of urine was passed from April 5 until the patient's death on April 12. In most recorded cases of obstructive suppression small quantities of pale urine have been passed; indeed, it was pointed out by the late Sir William Roberts that this is a condition characteristic of "obstruction." (e) The absence of uræmia; seven days passed without the elimination by the kidneys of a single grain of urea, yet there was not a single symptom pointing to uræmia. (f) The duration of life. In this case it was seven days. Roberts states that it is as a rule from nine to eleven days. It is possible that had this patient lived longer, symptoms of uræmia might have developed, but they are not the general rule in such cases. The autopsy showed dilatation of the pelvis of the right kidney with atrophy of the organ, proving that at an early period it had ceased, through blocking of the ureter, to perform its function. The left organ had undergone the usual compensatory enlargement and had, up to the time of the blocking of its ureter, done all necessary work. The stone which blocked the ureter, while small, was large compared with one reported by Sir W. Roberts, which weighed but gr. 1 1-3. That so small a concretion should be the direct cause of death is remarkable. The pelvis here was not in the least dilated—a fact which shows that more time than seven days is necessary for its accomplishment, and that, inasmuch as but a few drops of pale urine were found, the pressure necessary to stop the secretion is very slight. Self-evidently, the treatment of this condition is operative as soon as a diagnosis is established, albeit there are some cases of spontaneous recovery reported, in one of which were passed twelve pints of urine within a very short time after the stone found its way to the bladder. It must not be forgotten that ninety per cent. of all cases of obstruction are due to stone, and that lodgment of a calculus does not by any means always cause pain. It is evident from a study of this and of cases parallel to it that uræmia in no way depends on an accumulation in the blood and tissues of excretory products which are normally excreted by the urine. There is an important difference in the pathology of the two conditions, called "obstruction" and "non-obstruction" suppression. In the first the kidneys are normal; in the second they are abnormal. Does not this suggest that there is a very important function of the kidney quite aside and apart from excreting? When a case of nephritis advances to the stage of suppression, the other functions of the kidney are also in abeyance. If a stone plug the ureter of a healthy organ, on the other hand, the excretory function alone is stopped. Thus one can conceive that the

kidney has a double function—that of creating an “internal secretion” as well as playing the rôle with which one is familiar. Is not the organ, like many others, “secretory,” as well as “excretory?”

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*Gonorrhreal Arthritis.* Chauffard, *Journal des Practiciens.*

The author presented two men with gonorrhreal arthritis in both of whom the knee joint was severely affected. As no improvement followed rest, ice, and tapping, they were transferred to the surgical service. In the first case three months had passed and two weeks in the second. In the first patient there was poly-arthritis; in the second, mono-arthritis. In both there were muscular atrophy and great effusion. No germs were found in the liquid removed by puncture in either case. In the treatment the salicylates internally and externally are indicated, yet have but little effect. Rest, puncture, and in some cases a plaster cast or arthrotomy are indicated. Finally massage and electricity will be of service.

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*Prognosis and Treatment of Chronic Nephritis.* De Lancey  
Rochester, *American Medicine*, Philadelphia, August 23.

The method advocated by Rochester is stimulation of the excretions, the use of the stomach tube and hot-air baths. The technique of such a bath at home is very simple. The patient is placed entirely nude between blankets in bed covered by two extra blankets, and steam of hot air is introduced through a nozzle in the blankets and bed-covering. He reports six cases, several of them treated by hot air or steam baths with benefit, and remarks in regard to the surgical treatment that in progressive signs of kidney degeneration shown by persistent increase in albumin when it should be diminishing, surgical procedure seems worthy of consideration, but as a method of treating true chronic nephritis it is entirely out of place. The prognosis in given cases of chronic nephritis depends on the secreting power that may be developed in the kidney with proper treatment and is also materially affected by the condition of the circulatory apparatus. If the arteries are much diseased and the myocardial nutrition interfered with the prognosis is not good, even though we may be able to cause free excretion through the skin and bowel. If there is no decided atrophy of the sweat glands interfering with their hypersecretion the prognosis is not good, and an excessive degree of anemia unimproved by treatment is also of bad significance as well as is the frequent occurrence of marked uremic symptoms. We should not try to stimulate into activity an organ that is inflamed or degenerated, by the use of drugs that excite functional activity of that organ. Therefore, we should rarely have recourse to stimulating diuretics or those which

increase the arterial pressure. The diet should be looked after; the chief ingredient should be milk. In acute exacerbations or in uræmic states milk should be the only article of food. To aid metabolism exercise is necessary; massage where active exercise is impossible should be employed. The dilution of catabolic materials by drinking large amounts of distilled water or one of the mildly alkaline mineral waters is also advised. When toxæmia exists, with defective kidney action, wet cupping of the loins, a full dose of calomel, followed by a saline, and hot-air bath employed once or twice daily, preceded if necessary with a small dose of pilocarpin 0.003 to 0.005 gm. After the bowels have thoroughly moved there should be given hypodermically once or twice a day 500 to 1000 c. c. normal salt solution.

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*Rupture of Bladder (Zur Behandlung der intraperitonealen Blasenruptur).* Ledderhose, Archiv f. Klin. Chirurgie, Berlin, LVII. 4.

Ledderhose calls attention to the fact established by both experimental and clinical research, that the peritoneum tolerates to a remarkable extent an inflow of urine if not associated with infection. An intraperitoneal rupture of the bladder may heal spontaneously, but if there are no signs of peritonitis in twelve to twenty-four hours, indicating the formation of an encapsulated peritonitic focus, then laparotomy and suture of the rupture is imperative. But if peritonitis has developed the case is already inoperable if the peritoneal sepsis is in an advanced stage. If the peritonitis is slight or moderate, a permanent catheter should be introduced and the result awaited. If the urine flows freely through the catheter then merely opening up one or several circumscribed pus pockets may be all the intervention required. Suture of the tear in the bladder is unnecessary. There are 36 cases on record of primary laparotomy with successful suture of the bladder. In 34 other cases this procedure proved fatal to the patient. He has added 3 cases. In 1, all the urine had poured into the peritoneum for 56 hours. After about a quart had been voided through the catheter, the accumulation in the peritoneum disappeared.

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*Gonorrhreal Hemorrhoids.* George J. Monroe, Cincinnati Lancet-Clinic, August 23.

This term is used by Monroe, who thinks it might perhaps be better described as gonorrhea of the rectum. The external appearance is often very similar to external hemorrhoids, but if we cut into the lumps we find no coagulations of blood. They are frequently as painful as ordinary piles. There is a constant exudation of watery mucus, keeping the parts moist

and this helps in the diagnosis. There is much pruritus and burning, especially after defecating; the bowels are generally constipated. He reports a case and advises treatment. He would use calomel in one-eighth grain dose every four hours, also a saturated solution of boric acid, one ounce of this to the pint of warm water, injecting it into the rectum. When this passes out he injects nargol, ten grains to the ounce, requiring the last to be retained. This should be used twice a day. Twice a day he bathes the affected parts with peroxid of hydrogen, afterward with liquid extract of hydrastis canadensis and a special ointment of calomel, ichthyl, one dram of each to one ounce lanolin. For the tonic treatment he would use syrup of hypophosphites and the bitter tonics. He thinks the condition is one that has been neglected by rectal specialists and rarely diagnosed by the general practitioner.

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### LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.,

#### *Pneumatic Massage in Aural Practice.*

Pneumatic massage is now a recognized therapeutic measure in certain diseases of the ear. As in the case of other recently introduced measures, the manner in which it should be applied, as well as the cases in which it gives the best results, have not yet been definitely settled. Dr. Edwin Pynchon of Chicago has recently published an article on this subject in the *Laryngoscope* (May, 1902) which gives a carefully prepared résumé of this subject, the substance of which is as follows:

As air is the natural medium for conducting sounds through the auditory canal to the middle ear, it would seem most rational to make use of pneumatic massage applied to the external opening of the auditory canal. Hand massage, as with a Siegle pneumatic speculum, or a Delstanche masseur, has been extensively employed by otologists. In this progressive age, wherein machinery is supplanting hand labor in so many fields, it seems apparent that a properly constructed device, which perfectly gives the several modifications of the massage air current, should easily supplant manual treatment which, of necessity, cannot be administered without variation of fatigue during a séance of several minutes' duration. The therapeutic effects to be obtained all hinge upon the mechanical details whereby all possible variations of the air current can be produced.

A. The character of the air current: 1, simple vibration; 2, aspiration with release; 3, continuous aspiration; 4, compres-

sion with vibration, using (a) plain air or (b) medicated nebulæ.

B. The length of stroke of the pump piston.

C. The rapidity of the strokes.

D. The force or gentleness of the stroke, which later is secured by the use of an air rheostat.

E. The amount and character of the accompanying noise (phone-massage).

F. The length of the séance of treatment.

G. The frequency of repetition of treatments.

H. The duration of the course of treatment.

It is principally in the treatment of the so-called "chronic non" cases—the non-suppurative catarrhal otitis with ground-glass drumhead, which is so often the forerunner of sclerosis—that pneumatic massage is indicated, to improve the hearing and additionally to control or diminish the accompanying tinnitus which is probably most often due to labyrinthal pressure and has been tritely compared, by Spear, with the "seeing of stars when the eye is pressed," as tinnitus is produced whenever the tension within the labyrinth becomes greater than normal from pressure within, or from changes in the external ear, or the middle ear, with pressure from without. Vertigo, another symptom occasionally complained of, is also at times a result of pressure. Through its favorable effect upon the cause—middle-ear adhesions, etc.—pneumatic massage is often beneficial in both of these conditions. It also assists greatly in the correction of itching of the external auditory canal, and furthermore is generally instrumental in increasing the secretion of the wax when the canal has become too dry, both conditions being concomitant with chronic catarrhal otitis media. Additionally in hypertrophic cases, inflation by the Politzer method soon becomes more easy of execution.

In the treatment of middle-ear cases the aim should be to cause the defective ear to assume, as far as possible, the physical character of the normal ear, and most important of all, to increase the ossicular mobility. Passive flexure of ankylosed joints in other localities being the most valuable method of treatment, it would seem reasonable that a similar treatment, suitably modified to conform to the local conditions, would give the greatest promise of benefit. In addition to causing motion of the ossicles by breaking up adhesions, and absorbing hyperplastic deposits, massage stimulates and improves the circulation in all of the middle-ear structures, thereby increasing the nutrition thereof. For this latter effect the short, rapid, simple vibratory stroke is most efficient.

As forcibly stated by Jackson, pneumo-massage "frequently arrests the onward march of a progressive difficulty of hearing even if an absolute cure is not established. . . and offers good chances of benefit in all cases due to defect of the sound-con-

ducting apparatus, whether the result of purulent or catarrhal otitis media, and whether acute or chronic, hypertrophic or hyperplastic." In a general way those who hear better in a noise (paracusis Willisi) are benefited by pneumatic massage. The consensus of opinion of writers upon this subject is that deafness occasioned by suppurative disease of the middle ear is peculiarly favorable in its reaction to massage. Seiss states that senile deafness can be retarded almost indefinitely.

In cases of this class the conducting mechanism is primarily at fault, hence the trouble is essentially in the middle ear, though the labyrinth is quite prone to becoming secondarily affected to some degree. In these cases the chief objective symptom under ocular inspection is impaired mobility of the ossicles; associated with more or less dullness and thickening of the drumhead, which is also oftentimes retracted. It is in cases wherein the drumhead is most dense that pneumatic massage with long, slow vibrations is of most value. On the other hand when the drum is thin or atrophied, suction may add to the trouble without moving the ossicles; hence in this condition a very short and rapid stroke should be employed.

As regards the value of pneumatic massage in acute inflammatory troubles of the middle ear authorities differ. On the one hand, Seiss thinks it contra-indicated in cases accompanied by any active inflammatory process. In similar conditions Burnett advocates maintained rarefaction with a Siegle pneumatic speculum, so as to thus maintain traction upon the drum and its tensor. Lautenbach uses vibratory suction in acute cases as soon as possible, in order to avoid adhesions.

Pneumatic massage has proved of value in suppurative conditions of the middle ear, particularly in cases of long standing, and, when employed in addition to the usual line of treatment, will often greatly expedite a cure, owing to its mechanical effect in jarring or drawing down discharges from the attic. In the treatment of this condition either the continuous aspiration current or the aspiration with release current should be employed, with a piston stroke of such length and force as to not cause annoyance to the patient, and continued for about five minutes. Following this, and later on when cleansing is less required, the strokes may be shortened and the rapidity increased, so as to give greater stimulation, say 1-8 inch simple vibration at 300 v. for thirty seconds or longer. In recent cases of suppurative otitis media, after perforation of the drum-head had been produced, a very short, slow vibratory stroke may prove beneficial in the way of shortening the period of discharge and by preventing the adhesive formations which are so prone to occur.

For the welfare of the patient all well-known methods of treatment should be simultaneously employed, as care for hygienic surroundings, general medication when indicated,

tympanic inflations, and particularly an aggressive attack upon any and all malconditions of the nose and upper throat which may be present, in order to correct the chronically inflamed or catarrhal condition of the mucous membrane of the nasal passages and fauces, which, through continuity of tissue, is such an important ætiological factor in a very large majority of all ear diseases. It is after the correction of these nasal and faucial abnormalities when pneumatic massage added to the other treatment may give the most favorable results.

In order to watch the effect upon the tympanic membrane a pneumatic speculum can be used as the ear-piece, and such practice is particularly advisable during the first few treatments, or until the tolerance of the patient is learned. It is only the slow vibrations that can be seen and counted. Above 150 v. they run into each other and lose their individuality. A faint reddening of the drumhead is an indication to discontinue. A treatment "should never cause pain, vertigo, ecchymosis, or increase tinnitus; if so, it has been too vigorous." Old cases, with tough and thickened drumheads, will stand the greatest dosage, though tolerance in most cases will increase as the course of treatment progresses.

As regards the application of pneumatic massage in aural practice it may be said, in a general way, when addressed more particularly to the middle ear, that slow vibrations with but little noise are of the greatest value. When greater speed is employed its effect reaches more to the labyrinth, and this is furthermore favored by the increase of noise due to the more rapid motion of the engine. In order to secure the greatest range of therapeutic action it is essential to be able to command a stroke ranging from the merest tremor, say one-sixteenth inch, up to one inch or more, and as regards speed from 30 to 40 v. per minute up to 600 v. or more.

The conclusions to be drawn are that slow vibrations (30 to 90 v.) are generally best adapted to middle-ear troubles; that more rapid vibrations (300 v. and over) have a more pronounced effect upon the labyrinthinal nerves, and that improvement of middle-ear conditions will have a favorable effect on the labyrinth in those cases in which trouble of both the middle and inner ear coexist.

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## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D.

*The Alternating-Current Arc.* Abst. Elect. World and Engineer, September 13, 1902.

The alternating arc has been shown by the work of recent writers to have characteristics peculiarly its own. C. H. Bedell points out additionally its very interesting behavior when

in a magnetic field. That any arc may be "blown out" by the approach of the poles of a magnet is a well-known fact. If a magnet of the horseshoe type be used, "blown out" correctly describes the phenomena. If a bar magnet is used, the arc is forced out at right angles to the line of the magnet and not directly away from it, as the "blowing out" would lead one to suppose. The principle is the same as that which governs the action on wires carrying current on the surface of a motor armature, *i. e.*, the direction of the flow of the current, that of the lines of magnetic force, and direction of movement are all at right angles to each other. If the north pole of a bar magnet be presented to a direct-current arc and the current flows down, the thrust will be to the right; if up, the thrust will be to the left. With an alternating-current arc, however, the two effects are combined and the arc appears to have two wings. While these wings appear continuous, they do not exist at the same time, but follow the alternations of the current.

The appearance of the arc under the influence of the magnetic field is interesting, as the wings may easily be made to have an extent of five inches from tip to tip, and with an upward curve due to the currents of heated air. In attempting to photograph such an arc it was found necessary to shield the lens from the strong violet rays of the arc proper, in order that sufficient exposure might be obtained on the wings. The ends of the carbons, as shown by the photograph, although brilliantly incandescent, do not appear to give out many chemical rays. A short exposure was made to suit the violet arc, and the result indicated that but little violet light was given out by the incandescent ends. The question, therefore, arises, is not the curve of illumination for actinic rays for any arc lamp quite different from the curve of illumination for visual rays? Graphic illustrations of the current curve, both before and after separation by magnet, are shown in Bedell's article.

The experimental observations corroborate the writer's observations with the marine searchlight used for therapeutic purposes as described in the July number of *ADVANCED THERAPEUTICS*. The adjustment of the arc for near and distant work, as therein described, influences the current curve, without doubt, and in the one instance there is obtained a beam rich in actinic rays, while in the other, the visual rays are obtained in excess. The freshly trimmed arc is brilliantly incandescent and the beam obtained is brilliantly luminous, as well as excessively hot.

With the burning of the carbons a less brilliant light, with

but little heat, is obtained; but, on the other hand, the beam is very rich in the violet and ultra-violet rays. The longer the arc, the richer the spectrum in the actinic rays. The russia-iron funnel attachment meanwhile assists in absorbing the heat-rays as well as preventing the egress of the luminous rays.

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*The Production of Ozone.* Abst. Elect. World and Engineer, September 6, 1902.

C. P. Townsend, in discussing "Recent Electro-Chemical Developments," states that a diffused electric discharge has been regarded as best suited to the production of the allotropic form of oxygen known as ozone. Now the work of Bradley and Lovejoy demonstrates that the oxidation of nitrogen proceeds best in or around the high-voltage, direct-current arc. The spark occupies middle ground in respect to both reactions, having, as regards the oxidation of the nitrogen, about one-eighth of the efficiency of the arc, and exhibiting a somewhat larger fraction of the ozonizing power of the diffused discharge.

This is confirmatory of the writer's observations in using both influence machines and electric arcs therapeutically. The fact that, under the influence of a high-voltage direct current arc, the oxidation of nitrogen proceeds best points to the value of such an arc for therapeutic work where a rich yield of ozone is desired and where high-voltage direct current is available. For many physicians it is by reason of their locality the only current to be obtained, and the writer would recommend its use for therapeutic purposes, not only on account of the quantity of ozone generated, but also because of the chemical activities of the arc.

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*Experiments with Light in the Treatment of Pulmonary Tuberculosis.* Abst. Atlantic Journal Record of Medicine, August, 1902.

Robert F. Williams reports a case treated by light.

He uses "an enormous" arc light in which the carbons are set at right angles so as to save loss, and the light of which is concentrated by a series of large lenses, giving when reduced to a small focus, a light approximated at seventy or eighty thousand candle power. The heat is cut out by a water bath in which he has used methylene blue with good results.

Two months' treatment with the light seemed to result in the cure of the tuberculosis, which was well advanced, but the patient died subsequently of meningitis, the cause of which was not determined. He believes, however, that the case indicated the great value of light as a therapeutic measure in similar cases. His apparatus is that known in the market as the actinolyte.

The use of the lenses of glass in the actinolyte serves to cut off to a very great extent the actinic or chemical activities of the arc, which both experimentally and clinically have been shown to be of the most value in the treatment of tubercular and malignant conditions as well. For therapeutic work a mechanism devoid of glass lenses should be selected in preference to any other. The results are minimized otherwise.

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*Accomplishments of the Finsen Apparatus in Lupus.* Abst.  
Journal Am. Med. Ass., August 23 and September 13,  
1902.

Hopkins, in an illustrated article, reports an interesting case of lupus, with photographs before and after, sent him by Finsen. The photograph taken at the conclusion of the treatment shows an absolutely perfect skin condition. The lupus patches originally covered almost the entire face. Illustrations of Finsen's apparatus and also of Dr. Bang's new lamp are given. The latter covers a smaller space than the arc lamp, but, as has been pointed out, consumes much less current. This as well as the ability to use it without the intervention of lenses and cooling devices, renders it a more practical apparatus than the one devised by Finsen. There are many arrangements of arc-light mechanisms springing into use for the localized applications of light. M. M. A. Broca and A. Chatin have devised one which is illustrated and described in The Journal of Physical Therapeutics, July 15, 1902. They claim that no refrigeration is necessary, even if the part be only eight cm. from an arc of twenty amperes, and that compression is very easily effected by means of a quartz lens upon a mounting conveniently adjusted to the head of the patient. This lamp is fully described in Comptes Rendus des Séances de l'Académie des Sciences and is manufactured by Gaiffe of Paris.

Minin of Russia reports most interesting results in a series of articles on the value of ultra-violet light, in the treatment of localized traumatic inflammations, burns, inflammatory affections of the joints (arthritis, synovitis), lupus, contusions, superficial wounds, etc.

Because of the expense attendant upon the use of the Finsen apparatus, as well as the fact that it is very cumbersome, Minin has devised an apparatus, which is described as consisting of four ultra-violet electric lamps (one has ground glass) with reflectors, stand, etc. It can be used with either the most direct or the alternating current. Blech of Chicago describes the Minin lamp and believes from his limited observation that it has a wide field of usefulness.

Light is so valuable a therapeutic measure, that good results are obtained even though the arrangement of the mechanisms is not an ideal one.

Because of the physical fact that the high-frequency waves, or violet and ultra-violet rays, do not penetrate glass, it follows that an apparatus enclosing the light in a glass globe, or the intervention of glass lenses, minimizes the effect. The results obtained with such devices are due to the fact that glass does not completely prevent the passage of these rays, although lessening their number.

The writer has used the Finsen apparatus, but has discarded it because of the time and expense necessary to its operation. The marine searchlight, with the arrangement of carbons and the russia-iron funnel heretofore described, is being used with great satisfaction.

There is no intervention of glass lenses for cooling or other purposes and the rays that proceed in a straight line are reflected without passing through the Mangin mirror at the back of the back of the drum, while only those that proceed at an angle pass through the mirror before they are reflected. As the rays passing in straight lines represent the greatest energy it follows that the mirror interferes but little with the value of the light activities.

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## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D.

### *Cases Treated by the X-Ray.*

G. H. Stover, M. D., Denver Medical Times, August, 1902, reports some interesting cases, both of lupus and malignant growths.

CASE I.—J. R. S., male, aged forty-five, lupus on the outer side of right lower leg, involving an area of about fifteen square inches. X-ray applied three times weekly, five to ten minutes' exposure and about ten inches from the affected area. Pain was relieved and the case made an uninterrupted recovery.

CASE II.—Mrs. H., aged fifty-three, cancer at base of bladder; progressed favorably first month, and then pain and hemorrhage returned, with more involvement of bladder. He decides the case hopeless.

CASE III.—One of uterine cancer, in which, after sixteen treatments, a vesico-vaginal fistula was developed. Cancer is far advanced and he considers it beyond the hope of cure.

CASE IV.—Mrs. A., Hodgkin's disease. Great mass of glands on the side of neck, which measured fifteen inches in circumference. After twenty treatments it now measures thirteen inches and only one gland is enlarged, and that about the size of a hazelnut. Arsenic was given in this case, but the doctor ascribes the cure to the X-ray.

Dr. G. E. Pfahler, Therapeutic Gazette, July, 1902, reports three cases of epithelioma—all cured by means of the X-ray. All were cases involving the face.

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*The X-Ray in Cancer of the Uterus.*

Byron Robinson, M. D., in the Cincinnati Lancet-Clinic, in an article sums up the effect of X-ray in cancer of the uterus as follows:

1. Pain is lessened.
  2. The growth of carcinomatous mass is checked.
  3. It diminishes in volume.
  4. The tumor softens.
  5. The secretions become less and less offensive.
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*The Influence of the Roentgen Ray upon the Different Varieties of Sarcoma.* By William B. Coley, M. D., in American Medicine, August 16, 1902.

He refers to cases published by Drs. Williams, Pusey, and Beck of sarcoma and the very successful case of Dr. Skinner. Then he gives a splendid history of ten cases of sarcoma in his own work, treated by X-ray and toxin injections in amelioration.

CASE I.—M. L. A., a lady, forty-five years of age, first noticed tumor just above the clavicle two years ago. Removed the tumor, but it recurred and grew rapidly, involving the cervical glands and deeper structures; declared inoperable and sent to Dr. Coley for toxin treatment. Physical examination showed at this time a large tumor in the right cervical region, extending from the clavicle to the mastoid process of the temporal bone. There were some enlarged nodes below the clavicle and some small tumors in the axilla. The toxins were begun in October, and were given six months. There was a decided decrease in size of tumors and then mobility greatly increased, but the improvement ceased, and it was not thought wise to continue the toxins, and the tumors again began to enlarge and encircle the neck, and all hope was abandoned. At this time (February, 1902) the mass extended from the vertebral line and mastoid process to the clavicle on the left side, and on the right side occupied the entire cervical supra-clavicular, pectoral, and axillary region. The largest protuberance was in the right cervical region—about the size of two fists. The constriction has caused seven attacks of dyspnoea. With little hope of benefit the X-ray treatment was begun February 10, 1902. Four or five exposures per week were given at a distance of eight inches. At the end of three weeks a marvelous

change had taken place. The tumor masses had reduced fully one-third in size and were very movable. A small burn was produced in one place, but soon healed. The treatment was continued four times per week until the present time, and the improvement has been steady and continuous and she is now (June 5, 1902) fully restored to general health and able to go walking and riding. The tumors of the left side have entirely disappeared, except a few pea-like nodules, and on the right side a mass about the size of an olive. The tracheal and mediastinal mass has entirely disappeared. There remains a small mass the size of a hickory nut in the right axilla. A small nodule taken from the growth was examined by Dr. Biggs, the pathologist, who pronounced it the typical structure of round-cell sarcoma. The patient left the hospital July 8, 1902, entirely well.

CASE II.—Sarcoma of the femur. M., aged nineteen years, noticed swelling in the lower portion of the left femur in November, 1901; patient was seen February, 1902. Tumor extended from the condyles of the left femur to the junction of the middle and upper third of the bone. A fluctuation was discovered, opened, curetted, and drained. Curettings were examined and pronounced round-cell sarcoma. X-ray treatment was used and while the circumference of leg is reduced in size by treatment, it is feared commencing metastasis is taking place in the lungs.

CASE III.—Small round-celled sarcoma of the pectoral region. This case had been operated upon twice, with return after each operation, and sent to Dr. Coley for toxin treatment in December, 1901. This caused a softening and necrosis of the tumor and reduction in size. In February X-ray was substituted with no effect, and then a combination of toxin and ray produced a complete disappearance of the tumor, and the patient was dismissed in the best of health.

CASE IV.—Round-celled sarcoma of the fascia of the thigh. Female, aged thirty-seven; had been operated upon twice for removal of the tumor. The last time six weeks before. Neither X-ray nor toxin had any effect and tumor continued to advance rapidly, and after one month treatment was abandoned.

CASE V.—Very rapidly growing round-celled sarcoma; death within six months from date of origin. This case, one of sarcoma of the parotid, was operated upon twice with rapid recurrence; was then put upon toxin treatment by Dr. Coley with little benefit; then the carotid artery was ligated with no effect on the growth; after which the X-ray was used five times, and the patient being in extremis, the treatment was discontinued and the patient soon died.

CASE VI.—Recurrent melanotic sarcoma of the iliac glands. First operated upon five years ago for sarcoma originating

from an irritated mole in the region of left ankle. Four years later it recurred in the iliac glands and was operated on three times last year and is now being subjected to the X-ray treatment.

CASE VII.—Spindle-celled sarcoma of the upper jaw; forty-six years old, married. This was operated on several times; paste used, followed by toxin and then X-ray for three weeks, when it was abandoned, as no results were noticeable.

CASE VIII.—Small round-celled sarcoma of the gracilis muscle, four times recurrent. This very interesting case, in which the sarcoma occurred four times, was at last brought to health by the use of X-ray and toxins combined. It seemed neither was able to control it separately, but by combination the case was brought to a successful termination.

CASE IX.—Small round-celled sarcoma of neck, too extensive for further operation, and X-ray is being used and ten treatments being given, but yet no definite results; treatment continued and tumor (August 6) entirely disappeared.

CASE X.—Inoperable sarcoma of parotid. Case seems to give hope of success by the combined treatment of toxin and X-ray.

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## RADIOGRAPHY.

EDITED BY HERMAN GRAD, M. D.

*The Medico-legal Value of the Roentgen Rays.* By Dr. Carl Beck, Med. Record, August 9, 1902.

"Even the most skillful experts in fractures have ceased to deny that there is an enormous number of bone injuries which in former years could not be properly recognized, the general symptoms being either obscure or veiled by the swelling of the surrounding tissues. . . The Roentgen rays have brought about a revolution. They show the conditions as they are and are impolite enough to do this without the slightest regard for great authorities.

"We have learned now that our misinterpretations of skiographs were caused by insufficient anatomical knowledge, as well as shortcomings with which the rays had nothing to do. . . The Roentgen rays no longer need a gladiator in the medical arena, but their recognition in the courts need much to be desired.

"Since it is accepted by the medical profession that a plate which is accurately made by a physician specially trained in skiography, and interpreted by an expert, gives most valuable information, which cannot be obtained otherwise, the court should regard it its duty to acknowledge this fact and avail itself of it in the interest of justice. What a triumph for suffering mankind are the numerous cases in which veteran

soldiers, contemptuously treated as malingerers before the courts, can now show the skiagraphic proof of the presence of foreign bodies. A patient whose body harbors a bullet has indeed a very good reason to complain. The number of patients who submitted to unnecessary operations, because foreign bodies were suspected, but not found, and the still larger numbers of those who were not advised to submit to operation, although they were needed, on account of the non-suspected presence of foreign bodies, is legion."

The author relates the following interesting case, where the X-ray cleared up the diagnosis. For about two years the patient presented himself at the various clinics in New York City. "He showed a slight swelling at the outer aspect of his foot, which was diagnosed as periosteitis, osteitis, osteoma, osteoscarcoma, beginning tuberculosis, rheumatism, arthritis, syphilitic proliferation or exostosis, badly united fracture, etc. Later an amputation, as well as exploratory incision, was advised. After having suffered for more than two years he was ready now to submit to anything which would relieve him of the pain he suffered while walking. I was unable to make a diagnosis with the usual methods, but the Roentgen rays cleared up the situation at once, showing a needle in the sole of his foot. When the patient was informed of this fact he remembered that about two years ago, while sleeping on a lounge, he fell on the carpeted floor and noticed a sharp pain in his foot, which he thought was due to the fall itself. He had undoubtedly fallen on a needle sticking out of the floor, and by walking the needle had shifted into the joint, from which I removed it under considerable technical difficulties. It is needless to say his rheumatism disappeared at once."

Much more serious from a standpoint of humanity is the following case reported by Dr. L. Passower of Riga. "In November, 1897, a young farmer suffering from a swelling of his foot was admitted to the surgical division of the army hospital of Riga (Russia) for observation. Being a recruit he was expected to serve his military term. A year before a mass weighing thirty-five pounds had fallen on his leg, causing an injury which compelled him to stay in bed three months. It was reported that during that time the foot had appeared much swollen and ecchymotic. When admitted to the service of Dr. Passower at the military hospital he was limping and complaining of continuous pain in his foot. He was assigned a bed among old soldiers who were requested to watch him closely, as he was suspected to be a malingerer. After watching the case Dr. Passower came to the conclusion that the patient was suffering with a chronic inflammatory process of his tarsal bones produced by an injury, the possibility of a fracture was also duly considered. The medical board then suggested that the patient should be exempt from military

service for a year. The military commission of Riga did not accept this suggestion, because one of its physicians insisted upon the theory of artificial origin of the swelling. The unfortunate candidate was sent to the City Hospital of Riga where, after a second examination, he was accused of having injured himself by constriction and puncture in order to get rid of his military obligations. He was delivered to the public prosecutor, but set free after a long trial, through the efforts of Dr. Passower. A few weeks later he was arrested and sentenced to three months' solitary imprisonment for self-mutilation. Dr. Passower now recommended to transfer the prisoner to the clinic of Professor W. W. Koch in Dorpat, in order to obtain a skiagraph. This was at last permitted, and Professor Koch had a chance to ascertain that there was a fracture of the astragalus which had caused sinking of the sustentaculum of the astragalus. The patient appealed to a higher court, which dismissed the previous sentence. The patient was again skiagraphed at the hospital in Riga. The evidence in favor of the 'criminal' was too overwhelming, and so he was declared unfit for the military service.

"Thus an honest man was virtually imprisoned for nearly three years. If a skiagraph had been taken at the time of his admission to the military hospital (fully two years after the publication of Roentgen's discovery), the whole proceeding of ignorance and malicious arrogance would not have been set in motion and the physical torture of another poor individual would have been rendered impossible.

"It has occurred to me, as well as to others, that the normal os intermedium cruris (os trigonum tarsi) has after a single exposure been taken for a fragment severed from the astragalus. The os intermedium cruris is a typical part of the tarsus of all mammalia, and its frequency is estimated at from seven to eight per cent.

"The practical significance of this bone is evident from a case described by Williams of Hamburg. A laborer claimed that he was injured by an iron bar on January 20, 1897, but was able to work during the whole day. On the following day he called on Dr. Williams, complaining of intense pain at his internal malleolus. He limped and asserted his inability to work. A slight swelling was found at the internal malleolus, no ecchymosis was present. The patient was treated for several months, but he still complained of pain and maintained that he is unable to stand on his foot. A skiagraph showed a bone-fragment at the junction of the astragalus with the posterior surface of the calcaneum. On the strength of this skiagraphic 'proof' Dr. Williams, although mistrusting, was forced to modify his first statement and certified that the patient suffered from a fracture of the astragalus, in consequence of which he was damaged for life. The laborer received an annuity of

thirty per cent. in proportion to the estimated curtailing of his wages. Soon after the laborer was seen by Dr. Williams carrying a heavy load without any apparent trouble or pain, while formerly he had claimed to be unable to walk without a cane or crutch. Dr. Williams insisted upon another irradiation, this time also skiagraphing the uninjured foot. The skiograph showed the 'severed bone-fragment' which had first been regarded as a sesamoid of the *musculus flexor longus hallucis*, but which now was recognized as a normal os intermedium *cruris*. The society of course refused the annuity. In this case the Roentgen rays were very near becoming the contrary of what they are expected to be, namely, a protector of dishonesty. The fault would have lain with the insufficient anatomical knowledge and not with the rays themselves, which reproduced the conditions as they were.

"It is absolutely necessary to make at least two exposures in different positions in all fracture cases. In joint-injuries it is often necessary to make a skiograph of the healthy joint of the opposite side at the same time, in the same position and in the same projection. Sometimes it is also advisable to compare a normal skeleton with a skiograph, since some pathologic conditions like rachitis, syphilis, etc., influence the outlines of bones and may deceptively be supposed to represent a portion of an injury. The fact that in children the epiphysial tissues are not sufficiently ossified to produce a shadow on the plate has caused many but unjustifiable errors at the early Roentgen era.

"In many fractures the destruction is so extensive that a good result could not be expected under any circumstances. Then the patient may be tempted, not only to claim damages from his employer, but also from his physician. In such a case a skiograph, taken as early after the accident as possible, will be the best protection to the physician. It would be a document showing that the physician knew well the serious nature of the injury.

"If a deformity is caused by excessive callus formation, the skiograph will be the surgeon's advocate. In one of my cases considerable deformity of the wrist-joint was present, which caused disturbance of function. The skiograph showed the fragments in splendid apposition, proving that the deformity was caused by excessive callus formation, for which of course nobody can be held responsible. The patient, who accused his physician of malpractice, when he saw the skiograph, could be easily convinced by me that he had done great injustice to his physician.

"An important medico-legal question arose in a case which I will mention. A girl, twenty-three, fell downstairs on March 5, 1902. The family physician found considerable deformity, which he corrected to a great extent. When the swelling sur-

rounding the whole elbow did not subside in a week he referred the patient to me. Before taking a skiagraph I had the impression that there was a fracture of the external condyle. But the skiagraph revealed the presence of a fracture of the head of the radius, associated with considerable displacement, infraction of the external and fracture of the internal epicondyle, the latter injuries without displacement. Since I could locate the displaced radial fragment so well by the rays, I assumed that I could now also succeed in reducing it. But I was not able to palpate it. After a number of attempts the fragment of bone was finally pushed into place.

"In this case the diagnosis of the case without the Roentgen rays was simply impossible, and without a diagnosis the patient would surely be crippled. Would the court have the right to censure the physician if he had not advised skiagraphy? Could he be accused of professional negligence? If litigation ensued, would the other party have had the right from the beginning to insist that a skiagraph be taken? And if I had not succeeded in reducing the fragment would I have been criticised? I leave these questions to our learned lawyer friends. What, I may ask further, does secure the identity of the patient who is skigraphed? Is it sufficient that he signs his name on the envelop of the plate, with a pencil containing impermeable substance, so that his signature is photographed together with the limb, or is it necessary to have a witness present, or both?

"This brings us in touch with another question, which is a burning one in the full sense of the word: Is the physician responsible for an injury-burn caused by the peculiar influence of the rays, if they are used for diagnostic purposes? It seems that in some cases an idiosyncrasy exists which can be compared with the so-called iodoform idiosyncrasy. This susceptibility cannot be recognized to guard against a 'burn.'

"As the Roentgen rays have also shown therapeutic properties, the question of burns has reached a new phase. In order to exert the curative influence, frequent and powerful exposures are required, and consequently the chances of burning the patient are not small. Ulcerations and inflammatory conditions may originate and an unscrupulous patient may claim that they were caused by the injudicious use of the X-rays. How can the physician protect himself against such allegations? Is it necessary to have the patient sign an agreement stating that the risks of the Roentgen therapy were explained to him? Or are further ceremonies required?"

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Miss L. Had been suffering frequent attacks of pain at the angle of the lower jaw on the right side. Small abscesses would at times form, causing considerable distress. Dr. Geyer

was consulted and expressed the opinion that the disturbance might be caused by an unerupted tooth. To determine this a



An Unerupted Tooth at the Angle of Lower Jaw.

skiagraph was taken, with the result shown in the figures. The picture shows an unerupted tooth imbedded in the lower jaw, just at the angle.

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

*The Hot-air Bath.* By J. G. Nehrbas, in The Medical and Surgical Monitor for July 1, 1902.

"The hot-air bath is not only a most agreeable luxury to persons in good health, but it also possesses remarkable curative properties. It equalizes the circulation, eliminates impurities, dispels pain, increases glandular and cellular activity, and imparts a feeling of general comfort and well-being. For these reasons we find it not only a rational but effective remedy in grip and its sequelæ, rheumatism, neurasthenia, chronic inflammations, certain skin diseases, and all forms of intoxication. If the temperature and duration are regulated according to the patient's vitality, it does not weaken but imparts tone and elasticity to the muscular system; especially is this true if the bath is followed by appropriate massage. Sallowness, tan and freckles, caused by the increase of pigment granules, disappear under the increased elimination of the hot-air bath, and the skin becomes soft and assumes a beautiful clearness and purity of appearance.

"To secure these results, however, requires proper facilities and intelligent attendants. The nurse ought never be permitted to use routine treatment, but should administer each bath according to the physician's instructions. A thorough physical examination of every patient beginning a course of hydrotherapy should form the basis for our prescription.

"The lack of proper equipment and the indiscriminate use

of the ordinary bath cabinets, which are so widely advertised, accounts for the failure and frequent injurious results that follow this treatment as usually employed by the laity in the average home.

"The hot-air bath should always be followed with a shower or douche of suitable force and temperature, and when so given it is far superior to any other form of bath, as it practically combines the best features of all other hydriatic procedures. It is a great improvement over the Turkish or Russian bath, as patients are not compelled to inhale the foul air emanating from the body. It produces more perspiration and is therefore very cleansing and effective in excreting toxic material.

"Any agent which thus improves the general health, insures immunity from colds and infectious diseases, becomes a valuable adjunct to the physician's resources and merits the approval of all medical men."

We concur most heartily in the assertions of Dr. Nehrbas as stated above, excepting as to the uniform necessity of following the hot-air treatments with massage or hydrotherapeutic measures. A properly given dry hot-air body treatment accomplishes not only all that is attainable with the most thoroughly administered massage, but effects in addition a stimulation of the deep nervous centers that is quite beyond the utmost physiological limits of any manipulative procedure.

The addition of a "shower or douche of suitable force and temperature" would be in most cases but the imposition of another stimulus for the attainment of an object which had already been accomplished, hence, not only unnecessary but superfluous. In a well person whose reactive susceptibilities were unimpaired, such a combination would undoubtedly produce a degree of exhilaration in function and sensation, which would not ordinarily be obtained by either measure alone, but in the majority of sick persons—and we presume the author is writing of those who are ill—whose ailments are such as to indicate therapeusis of this character, we do not believe that increased benefit would follow the addition of hydrotherapy to thoroughly administered body hot-air treatments. We believe further that positive injury from overstimulation would result in an appreciable number of cases.

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## CLIMATOLOGY.

*A Comparative Climatic Study of the Arid and Semi-Tropic Southwest and its Relations to Tuberculosis.* By Wm. Winthrop Betts, M. D., Los Angeles, Cal., from the Denver Medical Times.

A location which really has merit is often unfavorably considered, principally because the people sought a climate without

regard to its probable effect on their case, or were carelessly advised. No climate, however perfect, will meet the requirements of all invalids, even when suffering from the same disease. There is no greater fake in medicine than climate, followed, as often happens, like a will o' the wisp; no greater boon, when the case in hand is intelligently placed under the most favorable climatic conditions.

The American Climatological Association has done much to popularize the study of climate, and to bring its selection to a more scientific basis, thus more nearly meeting the requirements of the case to be climatically treated.

Tables of temperature are apt to be misleading, unless studied with the latitude, elevations, and other climatic features of the locality in mind.

At Santa Fé, lat. 35° N., elevation 7000 feet, the average range of temperature for five years was 86°. The city is protected from the north and east by a spur of the Rockies, giving a very mild climate for so high an altitude. The temperature seldom goes below zero, or above 90°.

Denver, four degrees further north, 5290 elevation, has an average yearly range for the same period of 113°. Here we find a temperature 22° below zero to 98° above.

Salt Lake City, 400 miles west of Denver, and about one degree further north, gives an average yearly range of 100°, showing 10° below zero in February, 1899, and 101° above in June, 1900.

St. George, lat. 37° 9' N., 2500 feet elevation, 350 miles south from Salt Lake City, gives an average yearly range of 107°, from zero to 115° above.

Phoenix, lat. 33° N., 1076 feet elevation, gives an average yearly range of 80°. The temperature rarely falls below freezing, but in December, 1900, reached 22°, and in July and August, touches 115°.

The climate of the Pacific slope and the coast of Southern California presents striking features for comparison, and is represented by the data of Los Angeles and San Diego. Los Angeles, lat. 34° N., 330 feet elevation, gives an average yearly range for five years of 65°. The temperature rarely touches the freezing point, though in December, 1897, 30° was noted, and the temperature in May, 1896, reached 103°; but such extremes are rare.

San Diego, lat. 32° N., 87 feet elevation, for the same period gives an average yearly range of 54°; temperature ranging between the extremes of 34° and 98°.

In the arid country of moderate altitude represented by Phoenix and St. George, the temperature reaches 115°. Such a temperature in the moist and humid atmosphere of the Atlantic Coast, Eastern and Middle States, would be insufferable. But when we consider the difference between perceptible

and actual temperature, demonstrated by the wet and dry bulb thermometer, the perceptible temperature will be found 15° to 30° lower in the arid and mountainous country, owing to a lower percentage of humidity; corresponding to 80° or 90° in the humid atmosphere of the Atlantic States. That this is true is shown from the fact that sunstroke rarely if ever occurs. In this dry air which admits an uninterrupted sun's ray and so high a temperature, the perspiration is more rapidly evaporated, and the surface of the body is cooled, though the air is hot—as surely as evaporating ammonia freezes water—and maintained at the normal temperature, with less discomfort than in a humid atmosphere of 85° to 95°.

Another great factor in estimating climate is its humidity.

The average humidity is from 30 to 35 per cent. less inland than on the coast of Southern California.

The most important factor in estimating climate is its percentage of sunshine, for upon it depend so largely pure air, temperature, and humidity.

By a study we learn that a low percentage of humidity corresponds to a high percentage of sunshine.

While living at Salt Lake City, I grew to look upon Salt Lake climate as nearly perfect; that its sunshine was its chief attraction; and this is true, compared to the Eastern States. But for Salt Lake City the average for five years was only 65 per cent. Santa Fé gives an average of 75 per cent. and Denver 71 per cent. for the same period, while the country advertised the world over as "the land of sunshine," represented by Los Angeles and San Diego, gives respectively 73 and 71 per cent. Phoenix, in the southern interior of Arizona, shows a record of 84 per cent. St. George gives an average of 88 per cent., and represents the southwestern corner of Utah. The valleys of the Virgin and Moapa rivers in Southern Nevada and the northwestern corner of Arizona, have an altitude of 2000 to 3000 feet.

The consideration of precipitation is interesting, studied in connection with sunshine and humidity. The greatest average precipitation for the five years is found to be at Salt Lake City, 17.17 inches; the lowest at St. George, 6.61 inches. The greatest precipitation was at Santa Fé, 20.40 inches in 1897; the lowest at San Diego, 4.67 inches in 1898, each above and below the normal for the locality.

The effect on climate of the movements of the air is very marked. The winds are the ventilators and purifiers of the atmosphere; they also transport from a distance temperature and humidity. The condition of the wind, its direction and velocity, may vitalize or depress, and range from the gentle zephyr to the destructive tornado.

Of the localities considered, Los Angeles has the lowest maximum and hourly wind rate, Denver the highest.

It will be seen from the comparative data, that a great variety of climate can be obtained. But however ideal, no climate can be considered a specific for any disease; but usually a favorable climate can be selected which will prove a most valuable adjuvant to the cure.

While many chronic diseases are benefited by a change of climate, I wish to speak particularly of consumption, a disease which the best medical authorities tell us causes one-seventh of all deaths, and also inform us that one-sixth of the human race is tuberculous.

The high mountain area most favorably known to the physicians of the East is represented in the tables by Santa Fé and Denver. Both these cities are east of the Continental Divide, in a country across whose surface runs the watershed of the Southern Rockies. The whole country is a high plateau from 4000 to 7000 feet elevation. In all directions are mountain peaks, some of which reach an altitude of 10,000 to 14,000 feet. There are no towns having good accommodations less than 5000 feet elevation except in the extreme south of New Mexico. It has been said that New Mexico is a country of mountain peaks, sun, silence, adobe; but there is probably no climate in the world where a high altitude is so favorable for the cure of tuberculosis as New Mexico. Colorado cities and health resorts will be found clearly discussed by "Solly" in his work on "Medical Climatology."

The climate of Salt Lake City is not one of extremes. February and March are apt to be cloudy and stormy, but most of the year it is mild and delightful. The seasons are well marked, and the city is one of the most healthful in the United States. While it makes no pretense to being a health resort, it has many advantages in the way of hot springs and mineral waters, and the great Salt Lake City bathing resort.

The country known as the "Mormon Dixie" extends from St. George in Southern Utah to the Colorado River, covering a territory 115 miles long, varying in width from a few miles to twenty-five. Except in favorable localities along the Virgin and Moapa rivers, it is mostly rugged and unproductive. It is the border land between the perpetual verdure of Southern California and the barren winter hills further north. St. George, at the northern extremity of this remarkable climatic area, has a population of 1800; altitude 2300 to 2500 feet. The city is favorably located on the highest ground of a picturesque valley two and one-half by three miles in extent, protected on the east and west by a volcanic ridge 200 to 500 feet high. Across the foot of the valley runs the Virgin River, whose south bank is part a mountain range, leaving a cañon at either corner, between the south ends of the volcano ridges and the mountain range through which the Virgin flows. Just above the town and running across the north end of the

valley between the same volcanic ridges is a red sandstone fault with perpendicular walls 300 feet high. The great Pine Valley Mountains, a few miles away, and the general topography of the country still further divert the winds from the north. This gives an almost semi-tropic climate. All but the citrus fruits do well, particularly stone fruits, grapes, figs, almonds, and pomegranates. Green vegetables are taken from the gardens, and roses bloom in the yard up to the middle of December, and beds of violets shed their fragrance all winter. By February 1 the planting of gardens is again in progress and the almond trees are in bloom by the 10th. In the country further south, the season is from ten days to two weeks earlier. A low wind rate, no snow, very little rain, almost perpetual sunshine and a dry, balmy atmosphere not excelled anywhere in the arid region, give St. George an ideal winter climate.

For the past six years I have been familiar with Southern Utah and Southern Nevada. I spent the greater part of the past two winters at St. George and in the country to the south bordering the great Mojave desert; made many inquiries of physicians, leading Mormons, and business men, in regard to consumption, but failed to get a history or see a case of tuberculosis. The disease does not exist among the inhabitants and there are no primary sources of infection.

Travel through the Mormon Dixie is by horseback and stage.

The climate of St. George is an index to that of Southern Nevada and Northwestern Arizona. It is all a dry, desert region, modified more by altitude than by the difference in latitude, protected places being especially mild. The normal daily range of temperature is a striking feature of this desert climate and makes the hot summers bearable, the winters stimulating and delightful. For instance, in July, 1900, with an average maximum temperature of 102°, the average daily range was 44°, giving a night temperature of 58°, the lowest point being reached about 4 a. m. It will be seen that even when the days are hot the nights are comfortable. The average maximum temperature for January, 1900, was 55°, the average daily range 34°. The cold months have just enough frost in the air at night to make it crisp and bracing, but rarely chilly. The mornings are like the bright fall mornings of the Eastern States after the frost has opened the chestnut burrs. From 9 A. M. until 4 P. M., even an invalid can ride without the burden of a top coat or wrap, but in the early morning and evening a grate fire is cheerful and necessary, and one must always be protected when sitting in the shade.

St. Thomas, ninety miles south from St. George, at the junction of the Moapa with the Virgin River, is a locality of merit. The greater part of this country is off the railroad, but will soon be opened up by the new Salt Lake and Los Angeles line.

The section of Arizona spoken of as having a climate similar to the Dixie country is that in the vicinity of Kingman, on the Santa Fé Railroad.

Phoenix, nearly on a parallel with San Diego, represents Southern Arizona. It embraces all the climatic advantages of the St. George area and has a lower altitude and a higher average temperature.

Phoenix and the tributary country has been about the only section of Arizona known to the physicians of the East, but there are other localities with a slightly higher altitude, superior for a year-round residence.

So much has been written about the climate of Southern California that it will not be discussed at length here. But in view of what has been said in this paper, I wish to call particular attention to San Diego and Los Angeles. Are these cities, and the country near the coast, the most favorable localities for the consumptive? Manifestly not. Their advantage over the cities of the Eastern coast is not one of humidity, but of mild and equable temperature, thus enabling the invalid to live most of the time in the open air. The climatic advantages for the majority of consumptives are increased as the distance from the coast takes the invalid further and further from the humid atmosphere and morning fogs, and approaches that of the mountain and desert.

In no country in the world can so great a variety of climate be obtained without traveling hundreds of miles, as in Southern California. Pasadena, and the towns of the San Gabriel valley, are probably as favorable as any immediately accessible to Los Angeles. The altitude varies from 800 feet to the higher elevations of the bordering foothills, with the towering mountains of the Sierra Madre forming a majestic background. Viewed from the higher elevation, a country of surprising beauty spreads out before you, covered with orange groves that have successfully contested their right with the sage brush, in the march of irrigation and agriculture. Redlands, at an altitude of fifty feet, seventy miles from the coast, is the most favorably located of any of the smaller cities. It is on the borderland between the orange belt and the desert country, and is second only to Pasadena as the most attractive among the smaller cities of Southern California.

If one is willing to be deprived of some of the up-to-date elements of civilization, there are many localities superior to the large towns and cities. These can be found in the cañons, in the small towns further from the coast, and along the border of the Mojave and Colorado deserts.

Thus the ideal climate for the tuberculous is the one which will stimulate the greatest possible zest for out-of-door life, and is undoubtedly a mild, dry climate of moderate altitude, with a high percentage of sunshine, low wind rate, and comparatively free from the sources of tubercular infection.

## BOOK REVIEWS.

**THE INTERNATIONAL TEXT-BOOK OF SURGERY, BY AMERICAN AND BRITISH AUTHORS.** Edited by J. COLLINS WARREN, M. D., L.L.D., Professor of Surgery in Harvard Medical School; Surgeon to the Massachusetts General Hospital, and A. PEARCE GOULD, M. D., F.R.C.S., Surgeon to Middlesex Hospital; Lecturer on Practical Surgery and Teacher of Operative Surgery, Middlesex Hospital Medical School; Member of the Court of Examiners of the Royal College of Surgeons, England. Vol. II. Regional Surgery. Published by W. B. Saunders & Co., Philadelphia and London. Price, cloth, \$5.00 net, per vol.; sheep or morocco, \$6.00.

The second volume of this Text-Book of Surgery, with 471 illustrations and eight colored plates, is a most valuable addition to the library of a physician. To convince one's self of the excellence of the work one has but to read the names of the thirty-one contributors, men from all parts of America and Great Britain, and all of them of world-wide reputation. Not alone does the book treat of the entire field of modern surgery, but a valuable chapter is added, both on military and naval surgery. In addition, a chapter is given on tropical surgery, which cannot fail to be of interest to practitioners in the tropics. The work is up to date in every particular, and the editors are to be congratulated on having obtained such an array of well-known contributors. The volume needs no recommendation; it commends itself. One needs but to look through its pages to notice the excellent arrangement of the various subjects. The index is complete, the illustrations accurate, and the plates excellent.

This volume begins with the surgery of the mouth. The neck and chest are then dealt with. After this, over 250 pages are given on abdominal surgery. The volume is truly a text-book, just what it is intended to be. Concise statements of facts, accurate descriptions of technique and procedures, as well as the abundance of knowledge that is amassed in the book, make the work one of great value to the practitioner.

H. G.

**WHAT A YOUNG BOY OUGHT TO KNOW.**—The first volume of the Self and Sex Series. By SYLVANUS STALL, D. D.—Published by the Vis Publishing Co., 1138 Real Estate Trust Building, Philadelphia, Pa., and 7 Imperial Arcade, Ludgate Circus, London, E. C., and Wm. Briggs, 29-33 Richmond St., West Ont., Canada. \$1.00 net.

This little work is arranged in seven parts under the following captions: Part I., God's Purpose in Endowing Plants, Animals, and Man with Reproductive Organs. Part II., The Manner in Which the Reproductive Organs are Injured in Boys by Abuse. Part III., What are the Consequences in Boys of the Abuse of the Reproductive Organs. Part IV., How Boys May Preserve Their Entire Bodies in Purity and Strength. Part V., Our Duty to Aid Others to Avoid Pernicious Habits and to Restraine or Regain their Purity and Strength. Part VI., How Purity and Strength may be Measurably Regained. Part VII., The Age of Puberty and Its Attendant Changes.

The value of works of this kind to the growing generations is inestimable. Prudishness is too often the cause of the downfall and moral corruption of our youth. This work is carefully written, scientific, and a safe work to place in the hands of our little sons. We heartily commend it.

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### **SOCIETY MEETING.**

#### **AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.**

**Twelfth Annual Meeting:** First Day, Tuesday, September 2, Morning Session.—The meeting was called to order in the parlor of the Hotel Kaaterskill, Catskill Mountains, New York, by the president, Dr. Fred. H. Morse of Melrose, Mass., at 9.45 A. M.

The secretary read the minutes of the meeting of the executive council held on the afternoon of September 1, and also of the adjourned meeting of the council held at the Hotel Kaaterskill on the evening of that day.

The secretary read an epitome of the minutes of the last annual meeting of the association. On motion, the minutes were accepted.

Dr. Robert Newman presented a verbal report from the executive council, in which he called attention to the fact that the business of the association had been transacted for the most part by correspondence.

Dr. Newman then moved that the association proceed to the election of candidates recommended by the executive council. Seconded and carried.

The following candidates were acted upon separately, and then, on motion of Dr. C. R. Dickson, the secretary cast the ballot of the association for their election, and they were declared elected, viz.:

Dr. E. W. Baer of Chicago, Ill.; Dr. W. L. Kenney of St. Joseph, Mo.; Dr. H. B. Maben of Kingston, N. Y.; Dr. J. C. Luke of Ocala, Ga.; Dr. Marcus M. Johnson of Hartford; Dr. Sigismund Cohn of New York; Dr. Charles A. Covell of Syracuse, N. Y.; Dr. Albert J. Abeel of Syracuse, N. Y.; Dr. W. Winslow Eaton of Danvers, Mass.; Dr. George C. Goodell of Salem, Mass.; Dr. Laura V. Gustin-Mackie of Attleboro, Mass.; Dr. William Stevens of New York; Dr. Willis P. Spring of Minneapolis; Dr. Boardman Reed of Philadelphia, Pa.; Dr. T. D. Crothers of Hartford; Dr. Theodore H. Newland of New York; Dr. Allen R. Thompson of Troy, N. Y.; Dr. Harvey H. Roberts of Lexington, Ky.; Dr. Albert C. Geyser of New York; Dr. H. Grad of New York; Dr. Josephine Walter of New York; Dr. E. Hochheimer of New York; Dr. John W. Danner, and as associate mem-

bers, W. H. Hosking, M. R. C. S., of Masterson, New Zealand; W. E. Goldsborough of St. Louis, Mo.

Dr. C. R. Dickson moved that the executive session be adjourned until the morning of the second day, and that the association proceed at once to the scientific programme. Seconded and carried.

The president then introduced Mr. H. E. Eder, Manager of the Hotel Kaaterskill, who delivered the address of welcome. He said: I am not here to intrude upon your session further than to carry out the wish of those whom I have the honor to represent, and assure you of the appreciation of the compliment paid us by your selection of the Hotel Kaaterskill as the place for your meeting. I hope your stay will not only be agreeable, but that in your profession you may be benefited and helped by this meeting.

I have been accosted two or three times this morning as "doctor," and while I feel complimented I wish to say that I am not a doctor. However, if I were a doctor, I would certainly often prescribe pure fresh air and plenty of refreshing sleep. These are, I think, universally acknowledged to be beneficial to mankind, and I know of no place on the face of the green earth where they can be better obtained than on the top of this mountain, towering, as it does, about three thousand feet in the air—into the sky, if you please. As an evidence of the truth of that I simply refer you to one of Washington Irving's friends who is said to have dropped down on these hills for a nap of twenty years. I hope, however, that will not be your fate here, but that you will go away with a pleasant recollection of the Hotel Kaaterskill and with a desire to again honor us with your presence.

Dr. Francis B. Bishop of Washington, D. C., responded to the address of welcome as follows: The words of hearty welcome so ably expressed by our friend, Mr. Eder, find, I am sure, a responsive chord in every heart. There is a ring of sincerity and honesty about this address of welcome which is at once refreshing and convincing. It is my pleasant duty to extend to you, sir, the thanks of the association for the uniform courtesy and kindness that have been extended to us since our arrival here. Mention has been made of the refreshing sleep-producing qualities of the air, and this makes me feel, Mr. Eder, that you should have been a physician. I am sure, sir, that every one of us will go away from here carrying very pleasant memories of the Catskill Mountains, and of the Hotel Kaaterskill and its proprietors particularly. I am sure we shall not have any such impression as did a noted humorist, an American, I believe, traveling abroad, who, on leaving a hotel, was requested to leave some little momento on the register. In compliance with this request he took the pen and wrote: "I came to this hotel for change and rest; the porters got the 'change' and the hotel got—the rest."

Dr. Fred H. Morse then delivered the Address of the President.

On motion of Dr. William Stevens of New York, a vote of thanks was extended to the president by the association.

The scientific programme was then taken up.

Dr. C. R. Dickson of Toronto, for the Committee on Electrodes, said: I have to report that I promptly placed myself in communication with the other members of the committee, and also sent to every manufacturer of note in the United States a list of the various committees of the association, with the request that they would communicate with the committee regarding any new instruments upon which they desired to report to the association. With each communication I inclosed the report presented at the tenth annual meeting, setting forth the description of the standard connections adopted by the association in 1895, with their dimensions and recommendations as to standard forms of electrical instruments. In addition, I sent this report to every manufacturer of note on the continent and in Great Britain. I explained that the object of the committee was to obtain a uniform and universal construction for all apparatus.

Some of the high-vacuum electrodes for connection with the high-tension coils have been submitted, but we have no special report to make upon them. There is an electrode for use with the galvanic current for applying electricity to the ear. It is similar in form to the ordinary binaural stethoscope, a long, tapering sponge being in the place of the ear tip. A very similar instrument, but without the sponge, has been devised for use with the high-frequency currents.

Another form of electrode is a metal receptacle ending in a point, which is intended to be used with the static machine. The operator holds it in the hand, and it is not connected with the static machine directly. It is stated that solutions in this receptacle may be diffused in the direction of the patient in the form of vapor, and a certain amount of ozone is generated at the same time.

It has been suggested that all surface electrodes be plainly stamped with the surface area expressed in millimeters.

This is all the report our committee has to make at the present time.

On motion of Dr. Reyburn the report was accepted with the thanks of the association.

Mr. R. G. Brown, for the Committee on Current Generators, reported progress.

Dr. C. O. Files of Portland, Me., for the Committee on Electric Light Apparatus for Diagnosis and Therapy and the Roentgen ray, said that so many papers on this subject had been published that an extended special report from the committee seemed unnecessary.

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## THE ACTION OF THE X-RAY AND ITS USES IN THERAPEUTICS.\*

BY WILLIAM BENHAM SNOW, M. D.

The progress of the therapeutics of the X-ray since one year ago will be marked in the history of this association by the fact that at our last meeting no paper was contributed on this now all-absorbing subject. Truly wonderful and well-merited is the progress as shown from the published records of one year. The subject now receives the attention of many of the ablest men in our profession, and has consequently taken hold of the professional mind, in a manner which assures at least its thorough investigation, which is certain to place it in the rank it merits.

The knowledge of first importance to the operator who employs the X-ray for therapeutic purpose is the character of the apparatus and the physiological effect which it has upon the tissues of the patient.

First, we believe that it matters little what is the source of the current which energizes the tube, so long as it excites the character of ray applicable to the case at hand. Experience has already taught the workers in this field, who have done much in the treatment of tumors involving the deeper structures of the body, that the penetrating qualities of the rays is the matter of the first importance. In other words, for the treatment of deep-seated malignant growths tubes of very high vacuum are required, which necessarily call for an apparatus, either a coil or static machine, capable of exciting such tubes. In the writer's experience the apparatus to be preferred for this purpose is a static machine

\* Read before the American Electro-Therapeutic Association, September 2, 1902.

having at least ten revolving plates thirty to thirty-four inches in diameter.

While coils are often capable of exciting high tubes the operation is, as a rule, perilous to the life of both coil and tube. The coils which will energize high tubes daily for a series of cases, rapidly following each other, without serious injury to its parts, are rare; in fact no coil will excite high tubes without much risk to the tubes, which become high or punctured so rapidly that they are soon out of commission. As good results can be obtained with a static machine, without risk to the machine, and with much less expense and inconvenience, in the matter of tubes. Some of our foreign confrères and the early workers with the X-rays have generally erred in electing a low vacuum tube for therapeutic work. We note, however, a rapid change of sentiment in this particular during the past few months, and it seems now to be an established fact that while tubes of low vacuum are efficient in superficial cases, they are not superior to tubes of high vacuum in the same cases, while they fail utterly in affecting the deep structures to which the high tubes are well adapted.

The action of the rays upon the tissues, healthy, or otherwise, is a subject of unusual interest at this time, and will require much careful study to thoroughly establish the exact facts in this particular.

To the rate and character of the vibration of the X-ray is undoubtedly due much of the therapeutic effects derived. Devoid of the heat rays, which are marked by the lesser rates of vibration at the red end of the spectrum, these rays, however, are characterized by marked chemical action upon matter, evidenced in the action upon the sensitized photographic plate and the effects produced upon the tissues.

The characteristic effects upon living tissue following a prolonged exposure or series of short exposures are: (1) induction of impaired nutrition marked by alopecia and atrophy of the cuticle; (2) irritation evidenced by an itching sensation; (3) inflammatory action; marked by tanning dermatitis or deep necrosis, the latter followed by sluggish reaction and retarded restoration. The extent of the inflammatory process depends somewhat upon the character of the ray, but particularly upon the length and frequency

of exposures and the idiosyncrasy of the patient; (4) the rays destroy some forms of germ life, either by a specific action (which is doubtful); possibly by stimulation and attenuation from overgrowth; or, most probably, by rendering the pabulum unsuitable for their existence. As recently stated by me in a discussion before the Clinical Society of the New York School of Physical Therapeutics, and published in the July number of the *JOURNAL OF ADVANCED THERAPEUTICS*, I believe; (5) that the effect upon normal tissues is first to stimulate normal action, due to the vibratory effects of the rays, or of the ether in the presence of the rays; (6) that short exposures induce activity of normal tissue cells, which, in some cases, supplant abnormal tissue elements, without showing evidence of disintegration; (7) that longer exposures destroy the abnormal tissue elements of low vitality, but do not seriously affect normal tissues unless the exposures are too prolonged; (8) that abnormal tissue elements thus exposed break down and disappear through the natural channels of absorption, or by sloughing; (9) when tumors of considerable extent are rayed, rarely, if ever, over small tumors, a marked reaction occurs, with fever and varying degrees of prostration, and in a recent case of cancer of the uterus treated by me there was severe diarrhea following the sixth exposure. The reaction, in my experience, has occurred on the day following the first exposure, in one case severe, or has been deferred to days following even the sixth exposure. It is likely that the reaction arises from breaking down of devitalized tissue, and auto-infection, which is often marked during the sloughing process.

The results of the tissue changes, as studied microscopically, after a course of X-ray treatment to the present time are not conclusive. It is hoped, however, that careful investigation in this particular will be made in the future. There are doubtless many effects derived from X-ray exposures upon pathological conditions, which require other explanations than the above actions will include.

While at the present time the X-rays are employed specifically in the treatment of the most intrâctable types of disease, favorable results have also been obtained in many conditions not associated with malignant disease. In this particular the reports are most encouraging. Basing our thera-

peutic applications upon the indications shown from the action of the rays, we are led to apply them to all conditions where it is sought to replace unhealthy tissue growth by that which will be normal. Tissue of low vitality, characterized, as it may be, by the presence of some specific process, we repeat, is broken down and destroyed by the X-rays; at the same time, the vitality of the normal tissues is not lowered to a dangerous degree, which makes it possible that normal tissue will supplant the disintegrated neoplasm. In order to facilitate the restorative action to the greatest degree by the reconstruction and replacement of broken-down cells by a healthy new growth, some means which will contribute to the induction of an active and healthy metabolism, is indicated. For this purpose, we believe, for its effects upon superficial structures, there is no other measure equal to the brush discharge, as administered with the wooden electrodes connected with a metallic grounded circuit, the patient being insulated and connected with the negative side of a static machine, the positive side being grounded. The results, uniformly obtained from the employment of the brush discharge, we believe, justify its general adoption in the treatment of all open and ulcerating surfaces, malignant otherwise.

(10) Another action is suggested by results obtained from its control of pain and hemorrhage, viz., that it causes in the deeper structures, as well as the skin, contraction of the muscular coats of the arterioles, relieving congestion and the consequent pain, as well as diminishing hemorrhage in some diseased conditions, as cancer and fibroid of the uterus.

A study of the action of the X-ray suggests many uses in therapeutics. At the present time, however, there are results constantly arising from its employment not to be accounted for by any definitely explainable action; such effects must be looked upon as results to be studied.

The effects upon the skin suggest its employment in keratitis, acne, elephantiasis in its early stages, removal of superfluous hairs, and all conditions in which it is desirable to induce atrophy of the cuticle and remove neoplasms. Alopecia is, however, but temporary, when induced by the X-ray, unless the process is repeated at intervals until the hair follicles are finally destroyed. Its action upon super-

ficial inflammatory conditions is probably due somewhat to its effect upon metabolism, not unfavorably influencing the normal tissue elements while causing the abnormal elements of low vitality to break down. The two forms of lupus, rodent ulcers, epithelioma, and superficial sarcoma are invariably cured either by the X-ray alone or in conjunction with the brush discharge.

That many other affections of the skin are satisfactorily treated by the X-ray there is reason to expect.

That malignant growths, wherever situated, may be favorably affected and often cured by this means there is abundant evidence, but to combat the growth and effectually remove every trace of malignancy often taxes the skill and patience of the operator. High tubes, the removal of intervening materials, raying through open cavities, and the employment of tubes, which may be placed within such cavities, and regulations of frequency and length of exposures, may all contribute to the successful termination of malignant growths, not superficially located.

When tumors beneath the integument or in the closed cavities of the body break down, as they often do, auto-infection, as a rule, occurs, associated with rise of temperature and marked depression. These cases will prove fatal in many debilitated patients. The writer is familiar in his own practice and that of others with cases which have given unquestionable evidence of such infection following, or associated with, sloughing. It is therefore a matter of great importance when undertaking the treatment of a case of internal cancer to consider the advisability of having the bulk, if not the whole, of the malignant growth removed after a short period of raying and thus prevent the danger, possible to arise from auto-infection and at the same time increase the patient's chances of recovery.

The advisability of operation in cases which, without the employment of the X-ray, would be considered inoperable, will offer encouragement for a successful termination in many cases. I have in charge a case in which there was cancer of the uterus and appendages, which was referred by me to Dr. Frank Hartley, and operated upon by him in the New York Hospital, in which an operation would have been useless but for the fact that the X-ray was to be employed after

the operation. Unfortunately, in this case, it was impossible to have the X-ray employed at the hospital, and for some time after the patient's dismissal she was unable to make the necessary trips to and from my office. After six weeks, on account of severe hemorrhage, without consulting me she returned to the hospital, but was not admitted, but referred to my office. When the patient came, the vault of the vagina was open and ulcerating, the recto-vaginal septum was indurated, there was a vaginal discharge, which was extremely offensive, and the ulcerated surfaces bled freely. In this case it was deemed best to ray the parts through a speculum. After each treatment the patient was tamponed with iodoform gauze, which was left in position for forty-eight hours. She has continued to come to my office every second day. After the third raying the discharge ceased to be offensive and the hemorrhage had practically ceased. Since the third time she has also been rayed above the pubes, and at present the ulcerated surface appears to be healing, hemorrhage has ceased, the tampons have been abolished, and the patient bids fair to make a recovery.

It seems that this is the rational procedure, which should be followed in all similar cases, operable and inoperable. In the light of present experience we feel justified in saying, no malignant tumor should be operated upon unless it is to be subsequently rayed, and we believe, as well, that raying should precede the operation, at least for a short time, in most cases. At the present time, in the face of surgical history and the scars produced, it is absurd to contemplate any operative procedure whatever upon a superficial epithelioma. In the treatment of both forms of lupus, the X-ray should, we believe, be used, in conjunction with the static-brush discharge. Our plan is to ray the patch upon alternate days, employing from the first the brush discharge daily.

We have demonstrated that lupus vulgaris may be cured by the use of the brush discharge alone, but undoubtedly the results are greatly hastened when employed in conjunction with the X-ray. On the other hand, in our experience, lupus erythematosus yields so slowly to the brush discharge that it is questionable if it can be cured in many cases without the additional use of the X-ray. After faithful employment of the former, for more than six weeks daily, in one case the

improvement was but slight; the case was then exposed to the X-ray on alternate days for ten minutes; six exposures were made, when the surface began to slough, and continued to do so. The brush discharge was actively employed as previously, and the whole surface was rapidly healed within one month.

Another case is of lupus erythematosus, of seventeen years' standing, which has been known during that time to the leading dermatological clinics in the city of New York. The patient was rayed on alternate days eight times, beginning on June 16, 1902. The brush discharge was employed daily. The case made a most rapid and uninterrupted improvement. On August 25 it was thought best that another series of raying be instituted. The case is now so greatly improved that but a short period remains to complete the cure.

The effects upon painful conditions of neurotic character are truly wonderful. A case of tic douloureux of eight years' standing, during which time paroxysmal attacks have been constant, was relieved after each exposure and has remained cured for five months after four X-ray exposures at which a tube of high vacuum was employed. Another case of brachial neuritis, involving the plexus within the chest, was greatly relieved, and the cure hastened by exposure to the rays from a high-vacuum tube.

Our experience with acne of the pustular type is confined to two cases, in which the X-ray has again proved most satisfactory. The cases had both been under treatment by specialists, for some time without making any improvement. The X-ray was employed on alternate days until a slight redness appeared, and then discontinued until it disappeared. Raying was then kept up irregularly, watching the ever anticipated dermatitis. The brush discharge was used on the same days that the rays were employed; these cases both made rapid improvement to complete recovery and are now cured.

A case of more than usual interest was one in which tubercular glands had been removed, along the course of Poupart's ligament on the left side. Two weeks after the operation the surrounding tissues were deeply indurated over an area three inches in diameter, and showed no signs of

healing. The wound had a cadaverous appearance. The case was referred to me by my assistant, Dr. Grad, in the clinic of the New York School of Physical Therapeutics. The improvement after the third exposure to the X-rays was most remarkable. In this case also, as in all ulcerations and open surfaces, we employed the brush discharge on each day that it was exposed to the X-rays. The rays were employed in this case five times, and the unhealthy wound granulated and healed rapidly.

Laryngeal cancer, we believe, can, as a rule, be favorably treated by applying the rays from a high tube over the larynx. A case which I have treated since April 1 has made slow but progressive improvement, and is now beginning to phonate articulate sounds. The case has been under the observation of several specialists, all of whom pronounce the local conditions markedly improved.

A case of sarcoma of the face, which was referred to me by Dr. W. B. Coley, has shown most remarkable change, demonstrating very many valuable features of the effects of the X-ray.

A tumor upon the orbit rapidly vanished, and it was demonstrated in this case that the eye is no more susceptible to X-radiance than the skin; (2) that large tumors disappear by sloughing within mucous cavities; (3) that the process of sloughing is associated with rise of temperature and depression; (4) that the greatest progress towards improvement takes place during periods marked by lost appetite and depression, possibly a coincidence; (5) that high-vacuum tubes are indispensable to the treatment of such cases; (6) that with great caution and raying every second day, for ten minutes, may be followed by second degree dermatitis; (7) that patients do not become more tolerant from prolonged treatment; (8) that when the tumor is removed by the rays from one part, it may assert itself with vigor in another location; (9) that malignant tumors beneath the integument will disappear when exposed for a period of time to the X-ray; (10) that long periods of time are essential in some cases to effect a cure or determine a failure.

The field of radiotherapy abounds in great possibilities, and is now but newly entered. Time alone can define the limitations. Earnest study and investigation are demanded;

Let those who are prepared to enter and those who have entered move on with proper regard to the dangers and possibilities, and we have abundant reason to believe that some of the awful scourges of humanity will be shorn of their terror.

#### DISCUSSION.

Dr. G. Betton Massey said that all present must have been pleased with the scientific tone of this paper—with its moderation and cautiousness. The fact that such results as described in the paper were possible within such a short time after learning of this treatment appeared to him to be a warning, emphasizing the necessity for caution in our advances in this new field of therapeutics. Dr. Massey said he had been talking for seven years of a most valuable treatment, yet he could count upon the fingers of one hand those who had adopted this mode of procedure. One of the reasons for this was to be found in the fact that ether must be given to the patient; another, that the technique was difficult. The treatment referred to was one for destroying cancer, and in this dread disease one was warranted in employing extreme measures and the utmost care. He would not for a moment belittle the value of the X-ray treatment in cases of cancer, and he agreed with the reader of the paper in concluding that the X-ray treatment was valuable especially in connection with operative cases. Personally he was not so much opposed to the knife as he was supposed to be, but there were limitations to it.

Dr. C. R. Dickson spoke of the systemic effects of the X-ray treatment, for but little had been said about this in the literature. He had known this treatment to produce diarrhea in a number of cases, and in cases of internal cancer this was so apt to take place that he urged these patients to keep the secretory apparatus in the best possible condition. He had known a severe diarrhea to occur within two or three days after the use of the X-ray treatment, *i. e.*, at the time when the tissue was breaking down, and it was well to warn the patient that this was likely to occur. There were many theories regarding the action of the X-ray. One that appealed to him was that the cells of the system were ordinarily under the control of the trophic nerves, and that when these cells were no longer under the proper control of the trophic nerves they underwent an abnormal growth. His idea was that the cells no longer under the control of the trophic nerves break down much more readily than the normal cells under the influence of the X-ray. The brush discharge should be used in all open cases. As to the matter

of tolerance, he would say that when the tissue could be "tanned" the patient became much more tolerant of the X-ray. In some cases of lupus it had seemed to him that tolerance had been established even when tanning had not been produced. In one case he had found it necessary to gradually bring the tube nearer until it almost touched the surface.

Dr. Robert Reyburn raised the question as to what apparatus should be used for the production of the X-rays. The great majority of physicians, he said, appeared to be using the static machine. With the Ruhmkorff coil it was necessary to use a powerful battery, and hence one obtained too much amperage. He believed this explained why X-ray dermatitis was so apt to be produced by the X-ray coils. As yet he had not seen any X-ray burns produced with the static machine.

Dr. J. D. Gibson said that he had used the Kinraide coil a good deal, and with good results. With the static machine he had had no trouble with burning; with the coil he had been very successful in burning his patients, though it was only fair to say that the patients treated with the coil had previously received considerable X-ray treatment with the static machine. He approved of all that had been said in the paper with regard to the therapeutic effect of the X-rays. He was of the opinion that all chronic inflammations, whether within cavities or elsewhere—even perhaps a few cases in which there were small collections of pus—could be favorably influenced by the X-ray. He had treated cases of antral abscess occurring in persons suffering severely from neuralgia, and in whom the antrum had been already washed out, and had been greatly pleased with the marked relief afforded by the X-ray, though he could not as yet report any cures. He believed good results would follow the use of the X-ray in fibroid tumors, particularly in those cases in which there was a tendency to hemorrhage. In one case of very large uterine fibroid associated with severe hemorrhage in which he had met with great difficulty in controlling the hemorrhage even with the galvanic current, he had been able to control the hemorrhage after the first exposure of fifteen minutes to the X-ray. The treatment had accordingly been kept up with the X-ray, and the hemorrhage completely controlled. The galvanic treatment had only slightly diminished the bleeding, though a current of 150 ma. had been used. The treatment with the X-ray had now been continued for about three months and the hemorrhage had been completely controlled. The circumference at the waist had been reduced about six inches. The exposures were made daily for seven or eight minutes.

Dr. M. F. Wheatland said that he had at present under treatment a gentleman who had been treated previously by a New York surgeon for chronic appendicitis. As the patient was advanced in years he shrunk from an operation, and hence sought other treatment. He had been treated with the X-ray, and incidentally it had been noted that chronic constipation was relieved by the X-ray. He mentioned this because allusion had been made in the paper to diarrhea following the application of the X-ray. The patient had received two treatments per week and had been relieved of pain. The speaker mentioned a case of cancer of the breast in which the X-ray had been used. Shortly after beginning this treatment the pulse became intermittent, and the patient's general condition became worse, apparently as a result of the absorption of cyto-toxins.

Dr. Francis B. Bishop said that success with the X-ray in superficial cancers had been quite uniform with different physicians. He had had some remarkable results in tubercular glands of the neck, and enlargement from myxedema. In one case, that of a young lady, the glands were about the size of a large orange, and in a few weeks the swelling had been reduced to the size of a hickory nut. One important feature of the X-ray treatment was the attainment of good results with the minimum of scarring. Apparently not only did the X-ray produce an effect upon the morbid cells, but also stimulated the healthy cells to granulation. Mention had been made of the brush discharge, and hence he would like to refer to an experience with this discharge in a fibroid goiter. The patient was placed upon a positively insulated platform and the operator stood upon the floor without having connection with the machine, holding in his hand a stick, two and a half feet long, to the end of which was attached a very fine wire, such as may be obtained from the rheophore. With this arrangement, without causing the patient any discomfort whatever, the entire surface could be reddened in a very short time. In the case referred to, after treatment for about twenty days the circumference of the neck was reduced about three-quarters of an inch.

Dr. R. J. Nunn said, that he thought that the production of constitutional disturbance could be largely obviated by cautious and prudent treatment—in other words, the powers of the patient should be tested and the treatment stopped short of producing so much poisoning that the patient could not tolerate it without severe reaction. It had been said that diarrhea followed the treatment, but he had also met with constipation under the same circumstances, and he looked upon both as evidence of the constitutional effect. He had

seen burns as frequently produced by the static machine as by the coil. These things could be avoided by proper care rather than by the selection of special tools. He had seen patients escape burning when the tube was five inches away, and others get burned when the tube was seventeen inches away.

Dr. William James Morton thought the X-ray treatment was the most important subject that had ever come before this Association, and that it would remain an important subject for a long time to come. So far as his experience had gone in the practice of medicine, both medical and surgical, he had learned that there was no more important adjunct to the therapeutics of disease than the X-ray, if one excluded anaesthesia. Many might contend that there was a rivalry between the X-ray and the knife, but this he believed would soon be settled by increasing experience. It was well known what the knife could do, but the question was, What could the X-ray offer which would detract from the recognized procedures of surgery? He had been deeply interested in the paper, but it was so comprehensive that it was difficult to discuss it. He was a little disappointed to see any other method of treatment employed in conjunction with the X-ray, and was sorry that the brush discharge had been employed in this way, because it was most important to know what did the work, the brush discharge or the X-ray. A prominent practitioner in London was now claiming to cure consumption by high potential discharges, and another very prominent practitioner in that city claimed that the curative results obtained from the X-ray tube were from the ordinary electricity and not from the X-ray. Much time had been wasted in discussing whether coils or static machines were employed. He employed both constantly, and it seemed to him entirely immaterial which was used; the X-ray seemed to him to be the same regardless of the source. We would probably soon have a means of measuring the intensity of the X-ray, and with an X-ray of a given intensity he saw no reason for expecting any different effects from such X-ray whether produced by a coil or by a static machine. The coil was not harder on the tube than the static machine. He had had two high tubes which could not be actuated by powerful static machines, and yet could be easily excited by a coil—a manifest advantage. He tested the tube with the fluoroscope at a distance of two feet, and determined whether he could get a good result through the wrist or through the thorax. In this way he found that, except with the high tube, he could not get a view of the deeper parts. The action of the X-ray should be sufficiently intense to reach the part which it is desired to treat, hence, the sci-

tific and careful observer was forced to make use of high tubes for the treatment of many cases because otherwise there was no guarantee that the X-ray reached the desired part.

With regard to the action of the X-ray on living tissue, he thought we knew nothing whatever about it at present. The physicists were floundering about, and the pathologists were far from agreed as to what was the nature of cancer. At the present time, therefore, our knowledge was wholly clinical. He had found it an exceedingly grave responsibility to determine whether or not he should accept cases of cancer for X-ray treatment. If a surgical operation offered the best chance, it would certainly be culpable to treat such a case by means of the X-ray. The superficial cancers, particularly of the face, could be almost invariably cured without the knife, caustic pastes, or mercurial cataphoresis. All of these other methods remove tissue in bulk, both healthy and diseased, and the amount to be removed was entirely decided by the operator. On the other hand, the X-ray had the power of influencing diseased tissue wherever found. If the X-ray could cure the affected lymphatics and the primary carcinoma, then, of course, it had cured thousands of unknown foci. What paste, what mercury, and what scalpel would do this? If this were the truth regarding the action of the X-ray, then a wonderful advance had been made in the treatment of cancer. He thought most of those working in this field would admit that this was the truth. He was of the opinion that many had erred in using the screen. It was the device of the timid operator to prevent certain parts of the body from being burned. He had, in his own practice, practically discarded the use of the screen. The mere fact that a small carcinomatous area might develop in a few days into a rapidly spreading infection, or might already be spreading, showed the need of treating the parts widely. He would not, for example, treat a tumor of the axilla without also treating with the axilla the entire thorax, both front and back. He only used a screen at the present time to protect the hair and eyes, and for this purpose he used one made of tin foil. It was possible, he would admit, with the X-ray to cause the hair to fall out, yet with proper precautions he thought it more probable that the X-ray would make the hair grow better. The tube should be kept moving from one part to another. The abandonment of the screen, the wide treatment of the patient, and the frequent moving of the tube were, in his opinion, important adjuncts in the X-ray treatment of cancer. It was well to remember that it often took a long time to cure cases of cancer by the X-ray. He had had a large and encouraging experience with lupus and rodent ulcer of the face, but the results would be reported later.

A little patient had come to him from St. John, N. B., with a very bad acne of the face and extensive scarring. The diagnosis had been confirmed by Dr. G. H. Fox, and then he had begun the treatment with the idea of burning as much as he dared. This treatment had been kept up for about six weeks. Finally the burn extended into the true skin, and the latter peeled off five times. The eyebrows did not fall out. After about four weeks of desquamation the face began to resume its normal color and the cure was absolutely perfect, the skin being soft like that of a babe. Although the result was so satisfactory he did not feel like assuming the responsibility of treating another case in this way. A case of carbuncle had taught him that in all inflammatory tissue about to break down into pus the application of the X-ray would cause a rapid breaking down. In this connection it was well to say that he had treated a case of chronic appendicitis successfully, but for the reason stated had hesitated a good deal about using this treatment in an acute case. A case of fibroid tumor that he was now treating had acted exactly in the way described by Dr. Gibson. Cases of scrofulosis could be very satisfactorily treated with the X-ray, the enlargement of the glands being reduced to a small kernel.

He had been asked to say something about the treatment of carcinoma situated deeply in the abdomen. The great trouble in these cases was that the tumor did not remain a local one for any length of time. His experience had been chiefly with cases upon which operations had been attempted, and then the X-ray called in as a last resort. From such cases it was not fair to draw any inferences as to the value of the X-ray in this class of cases. In many of the cases so operated upon it would be found that there had been an enormous distribution of cancer throughout the omentum and perhaps the liver, and it was because of this rapid and extensive cancer infection that it did not seem probable to him much good would result from the application of the X-ray. He had never yet seen any case of cancer that had not improved under the X-ray treatment; all had undergone more or less retrogression.

In conclusion, the speaker quoted Talleyrand's view of women, *i. e.*, "We can't get along with them and we can't get along without them," and added that just at the present time the X-ray could not get along well with the operating surgeons and could not get along well without them. Some of the more limited cases of cancer could be treated by the X-ray until only a small nucleus was left, and then it seemed wise to do a minor operation to complete the cure. This, he thought, would be the final settlement of this important subject. A very prominent surgeon of New York City,

speaking of a case of cancer of the breast which had been referred to Dr. Morton for X-ray treatment, said, under date of August 21, that he would regard it as a very important fact if the lymphatics had become normal to the touch under the treatment. This surgeon added that he was an absolute pessimist regarding the curability of such cases by surgical operation, and only operated, with that object in view, out of deference to current opinion.

In answer to questions, Dr. Morton said that he treated cases of epithelioma of the tongue by stretching the patient's neck back across the head rest of a dentist's chair and applying the X-ray. He had treated nævus by applying the X-ray through an aperture in a lead screen.

Dr. Snow, in closing the discussion, said that he had stated in his paper that there were many things yet which required further study. He had stated also that it made no difference with the result what means were used to obtain the X-ray, provided the tubes could be properly energized. However, according to his own experience, he had used up six tubes with the coil as against one with the static machine. He had advocated the brush discharge because in various cases he had failed with the X-ray until the brush discharge had been used in conjunction with it. He believed in certain cases of cancer, in which failure had been reported, a good result would have followed from this combined treatment. He favored the use of the brush discharge in all superficial cases.



## X-LIGHT IN THE TREATMENT OF CANCER.\*

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(Conclusion.)

Out of 33 cases, then, we have up to the present time, 3 apparent cures; 13 that have been permanently benefited and are still improving with good prospects of ultimate cure; 12 that were temporarily benefited; 2 that experienced no benefit whatever; and in 3 the treatment was discontinued by the patient before enough applications had been made to indicate whether or not any results would have been produced.

In estimating the absolute value of these results we must bear in mind that every individual one of these cases was inoperable, and offered a hopeless prognosis both as to arrest of the disease or the attainment of euthanasia, under any other method.

The conclusions justified by the foregoing are as follows:

First, the pain of deeply seated cancer is removable by X-light to an extent ranging from slight amelioration to entire disappearance, in a large proportion of cases, whereby the victim is enabled to spend what remnant of life is left him in comfort and free from the pernicious phenomena which result from the continuous use of morphine, the only other therapeutic agent capable of producing even an approach to euthanasia in any appreciable number of cases.

Second, in many cases X-light is capable of exercising an influence upon deeply seated cancer of sufficient intensity to markedly retard the progress of the disease, whereby life may be prolonged even in cases where it cannot ultimately be preserved.

Third, in a proportion of cases, the figure representing which has yet to be ascertained, X-light possesses the power entirely to overcome deeply seated malignant processes, restoring the patient to apparently perfect health.

Fourth, a small number of deeply seated malignant growths exhibit absolutely no indications that they are susceptible of influence by X-light, and continue their ravages apparently unimpeded, ultimately compassing the destruction of the victim.

Fifth, phenomena consisting of chills, rise of temperature, etc., indicating infection and systemic toxæmia, not infrequently accompany the treatment of malignant disease by X-radiance. This condition is probably due to the development or liberation of a toxin, the formation of which is, also *probably*, dependent upon retrogressive metamorphosis occurring in masses of tissue which have become too deeply involved in the malignant change to be susceptible of regeneration. This auto-infection is capable of reaching a degree of profundity sufficient to overwhelm the nervous system and destroy the patient, hence it is wise to interrupt the treatment temporarily when systemic toxæmia first appears, and allow the organism time to rid itself of the noxious accumulation before a further influence is invoked. Measures favoring elimination will of course be helpful to a patient in this extremity.

These conclusions, considered in connection with the uniformly gratifying results reported by nearly everyone as following the application of this agent to the external and superficial forms of this disease, would logically lead up to an attitude toward the use of the X-rays in cancer which may be expressed as follows:

First, X-light can be relied upon to effect a greater proportion of cures of external cancer than any other measure or combination of measures now known, with the possible exception of massive mercuric cataphoresis as conceived, developed, and recommended by Massey.

Second, in all cases of cancer where it may be considered advisable to use the knife, the already demonstrated influence of X-light in antagonizing cancerous degeneration may be looked upon as indicating its application for a time immediately succeeding the operation in all cases, and in some cases for a time immediately preceding the operation as well.

Third, in all inoperable cases, the X-ray is imperatively indicated, because in a few instances it has apparently effected a cure of processes the most deeply located; in a considerable proportion of cases it has removed pain effectually and im-

proved the victim's general condition markedly, thereby rendering the remnant of his life comfortable; and lastly, because it is the only measure that offers the victim anything whatever in the line of hope for ultimate recovery or prolongation of life.

The time is not yet ripe for positive statements in reference to the relative values of coil or static machine as tube excitants, the absolute relative efficiency of high or low tubes, and many other points involved in the technique. In general, however, it may be stated that for superficial growths any good X-radiance is usually efficient, but for deeply seated processes rays of high penetration are essential.

Previous to a year ago it was generally believed that only superficial cancers were amenable to the curative influence of X-light, that it was necessary to induce dermatitis in order to secure a curative result, and that coil currents and low-vacuum tubes constituted the most efficient apparatus. Since then most brilliant results have been attained without the induction of any dermatitis whatever, and by employing high-vacuum tubes excited by the static machine. The coil and low tube, therefore, no longer enjoy an exclusive prestige. The disappearance of some cancers is hastened by setting up a dermatitis, and in these cases the greater volume of rays obtainable from a coil is undeniably of advantage, inasmuch as a burn will result from shorter exposures; but the advantage is more apparent than real as far as ultimate results are concerned, as the high-vacuum tubes excited by the static machine will burn quite as thoroughly, if the time of exposure is lengthened and the distance of the tube from the patient's skin decreased. I make this statement with a conviction born of an emphatic personal experience. Personally I treat superficial cancers with static machine or coil indifferently, and have not been able as yet to convince myself that the ultimate results differed in the least.

A measure which is frequently extremely useful in connection with X-rays, when a broken-down superficial case is responding slowly or unsatisfactorily to the latter alone, is the static brush discharge administered from the wooden ball held about half an inch from the surface of the sore. The effects are sometimes most happy as regards the rapidity of the reparative process inaugurated thereby.

In the treatment of internal cancers, however, the coil is at

a distinct disadvantage, and the speaker has discarded it entirely in this class of cases in favor of the static machine. The reason for the coil's inferiority is found in the greater volume of rays produced by this apparatus, whereby the time required to provoke a dermatitis is much shortened as compared with the conditions obtaining when a static machine is used. As a rule an exposure of ten minutes to rays excited by a coil is equivalent to one of fifteen minutes to those excited by a static machine, as far as liability to dermatitis is concerned. At first sight it would appear that the greater volume of the rays from the coil-excited apparatus would make up for the required lessening of the length of the time exposure, but up to the present time experience indicates that this inference is not correct. The beneficial influence of the rays upon internal cancer appears to be pronounced in proportion as the exposure is prolonged, and not to bear so much relation to the volume of the light. Hence an apparatus like the static machine, which enables us to maintain the corrective impulses for a period of time one-third longer than when a coil is used, exhibits advantages which cannot fail to make themselves felt in the long run. There is reason to believe that it may even, in some cases, constitute the difference between success and failure in securing favorable clinical results.

A question frequently asked is "What make of tubes is best for therapeutical work?" I have employed half a dozen different makes, and as a result of my experience am of the opinion that it is the quality of the radiance as regards the degree of penetration and volume producible from a tube in relation to a given case, rather than the name of the manufacturer, that should be taken into consideration. The quality of radiance applied should be determined by the conditions surrounding the individual case; as a rule great volume is desirable in external cases, but for deeply seated growths volume should be sacrificed to penetration. Every good tube-maker produces apparatus capable of meeting the requirements of these different conditions.

A point involving some difficulty is the rapidity with which the vacuum of high tubes will be worked up beyond a manageable limit by the long and frequent séances demanded in therapeutical applications. Chemical regulation of the vacuum is a partial success, and ordinarily will nearly double the life

of the tube. The method of overcoming the difficulty that has given me the most satisfaction has been to have the tubes made without chemical and exhausted to medium vacuum. Then when the tube refuses to glow from use, I bake it, at a temperature of 350° F., for from one to ten hours, according to the idiosyncrasy of the individual tube. If the tube is baked too long the vacuum will get too low, but that can always be easily overcome by running the tube hard for a few minutes with open spark-gaps.

The static machine used in the treatment of these cases was an apparatus of the pure Holtz type, with twelve revolving glass plates thirty-two inches in diameter; the so-called Morton-Wimshurst-Holtz influence machine. The results attained with this excellent apparatus have led me to hope that I may be able to do still better with still more powerful radiance, and I have just purchased a sixteen-plate machine of the same type, with which I shall treat my deeply seated cancers in the future.

The use of a shield during treatment to protect the sound tissues surrounding a malignant growth is usually advisable when treating external cancers. It may be composed of any substance capable of absorbing the rays, but tin or lead foil, gauge about 30, is most widely adopted at present. Rubber sheeting about one-quarter of an inch thick is recommended by Dr. Albert C. Geyser of New York, and besides affording ample absorption of the rays, exhibits the additional advantage of not attracting any of the exciting current from the terminals of the tube. Under some conditions when tin is used enough current will be diverted from the tube terminal to render impossible the proper lighting of a high-vacuum apparatus. The shield should be large enough to cover all parts of the body exposed to the rays and near enough to the anode to make the production of dermatitis at all probable, and a hole should be cut in it of a size and shape that will expose the growth and about an inch of the apparently sound tissue contiguous thereto. When treating internal cancer a shield is, of course, uncalled for and useless.

Unless he is unusually susceptible, the X-ray therapist will not require protection for himself, as the locating of the tube, placing of the shield, and all other procedures requiring him to remain in the field of threatening influence are executed

before the tube is lighted. In some cases, however, a protection is necessary, especially for the hands, and I have used ordinary gloves backed with rubber sheeting one-eighth of an inch in thickness, with entirely satisfactory results. As I have said previously, the rubber is efficient in absorbing X-light, and the glove is fairly flexible and easy to manage.

The distance of the anode from the patient's skin is important. In external cases it may be from three to ten inches, depending upon whether it is desired to provoke or avoid dermatitis. In internal cancers the problem is slightly more complicated. It has not yet been demonstrated that the induction of dermatitis is beneficial when the growth is deeply seated, and as a burn is always a source of marked discomfort and sometimes positive suffering to the patient, the accident should be avoided when possible. Other factors enter into this problem, as individual idiosyncrasy toward the action of the ray, and the fact that sometimes the development of a burn is most insidious, no sign of its having occurred becoming evident for ten or fifteen days, when all at once we are confronted by a most disturbing state of affairs. During this period several treatments will have been given, each of course, augmenting the mischief inaugurated by the first. Two unpleasant experiences of this sort have led me to avoid the uncertainties involved by always locating the anode ten inches from the patient's skin during the first two weeks of treatment. If an idiosyncrasy exists it will show itself ordinarily in two weeks. If no sign of dermatitis appears at the end of this time the tube may be placed nearer the patient if it should be considered desirable. The closer the anode is to the growth the greater the effect obtainable, but in my experience it has not been possible to locate it continuously, during the large number of successive treatments ordinarily required in these cases, at less than eight inches from the skin, without provoking a disturbance in this tissue sufficiently profound to demand cessation of the séances.

From a study of something over twenty-five hundred X-ray treatments administered by myself, I have adopted, as a routine measure, an exposure of fifteen minutes to rays excited by a static machine; and ten minutes when the coil is used. A longer exposure than this has ordinarily produced an undesirable degree of dermatitis, and a shorter has not produced

a proper degree of beneficial influence. The time period of the exposure, however, is of course dependent upon the quality of the rays, the distance of the anode from the patient's skin, and the frequency of the treatments.

With reference to the last mentioned, in those external cases in which it is desirable to provoke dermatitis, the applications may be made every day for five or six days, or until the result has been obtained. Ordinarily, however, applications every other day for two or three weeks and with decreasing frequency thereafter will be found entirely sufficient to produce a cure.

In internal cancer it is necessary to extend the treatments over a much longer period of time, and as it is usually desirable that they should be applied steadily and with as little forced interruption as possible, three or four séances weekly should ordinarily constitute the limit. The skin of some patients will stand an application every day for two or three weeks, and in those cases I have sometimes found it advantageous to treat them every day until evidences of dermatitis were observable, then send them home until it disappeared when the procedure could be repeated. Before adopting this plan, however, one must have thoroughly ascertained the personal equation of his patient as regards susceptibility to the agent, or deep and unmanageable burns will be likely to result. In brief, the frequency of the applications is governed by conditions surrounding the individual patient, by the distance between the anode and the patient's skin, and the time period of the exposure.

A fact of some interest and one that acquires considerable importance under some conditions, is that after a patient has been rayed half a dozen times, the progress of recovery is not usually abruptly interrupted, even if the applications are discontinued. The process of healthy resolution will ordinarily continue for several weeks thereafter. Illustrating this point, I had a patient, afflicted with a cancer of the lip as large as a silver half-dollar, under treatment for nine weeks without much apparent improvement. An attack of la grippe necessitated discontinuance of the treatment for four weeks. At the end of that time, when he appeared for resumption of the applications, the ulcer had reduced to the size of a silver three-cent piece, nothing having been done to the sore in the meanwhile.

In treating cancer of the uterus some operators use a

speculum to distend the vagina, on the ground that it is thereby possible to bring the rays into direct contact with the growth and secure a greater curative influence. I have never adopted this plan, because a vagina susceptible of distention sufficient to bring the whole of the diseased tissue within the field of application is a rare phenomenon. The peripheral portion of the growth where the process is spreading is that which it is most important to bring under the influence of the rays, and that is the very portion which the speculum fails to expose. Before reaching these parts the rays must pass through the perineal tissues the same with as without the speculum, hence as far as securing material arrest of the malignant process is concerned, I fail to see in what way it offers any advantage, except when the growth is small enough to render adequate exposure possible. If the growth is small enough for this it would probably be better not to depend upon X-rays exclusively, but to remove it with the knife first and ray afterwards, or subject it to massive mercuric cataphoresis.

The speaker's method of applying X-rays to uterine cancer is as follows: A tube of greatest possible penetration is used, excited by a static machine. With the patient in the dorsal position, legs flexed upon the body, the rays are directed upon the uterus through the perineum at one séance. At the next séance the patient lies upon her back with legs extended, and the rays are directed upon the uterus through the anterior abdominal wall, with the anode located high enough so that the pubes will not intercept the light. By thus alternating the areas of skin through which the rays are passed during successive treatments, the applications can be made twice as frequently as when the light is made to traverse the same path each time, without calling up a troublesome dermatitis. The skin about these areas always becomes deeply tanned ultimately, and later the tanned epithelium peels off, leaving a bright, fresh skin beneath, which appears to grow less susceptible to the destructive tendency of the rays with each repetition of the process. A limited degree of tolerance appears to be created.

In my opinion it will be found ultimately that the X-ray and the knife can be advantageously combined in the management of many cases of deeply seated cancer. The cancer cell is one that has reverted to a more primitive type, hence its rapid

proliferation and lowered vitality upon which characteristics its malignancy depends. The action of the X-ray seems to be in the line of a corrective of this tendency to reversion rather than cauterant and destructive. Whether this action is secondary, and dependent upon a primary destruction of inhibitive influence exerted upon a parasite, whether it is due to a physiological influence upon primarily aberrant protoplasmic activity, or whether it is destructive action exercised selectively upon the diseased tissue, is a matter which is still subject to discussion, but the important point in this connection is that such an action is exerted and that it can be utilized. When, therefore, a large cancerous growth is encountered that would ordinarily be considered inoperable, removal of it, or as much as possible of it, will render possible a more concentrated application of the rays to its remote threatening peripheral areas. As the patient's condition is ordinarily hopeless anyway, the gravity of the situation is not augmented by the extirpation, whereas the chances of a successful outcome to the use of X-rays are increased.

In the cases usually looked upon as operable, but even in the most favorable of which as regards prognosis the percentage of recurrences is so large, it is probable that in the near future it will be looked upon as wise to invoke this corrective action of X-light by raying the tumor for two or three weeks before operation, and to endeavor to perpetuate the tendency toward normal tissue formation by immediately following the removal of the growth with another course of radiotherapy. By thus combining methods the malignant process is gotten rid of en masse and at once, and the patient is given the best possible chance of remaining without the limits of that sixty or seventy per cent. category, expressed by the term "Recurrent after operation."

In conclusion I wish to state my emphatic conviction that the therapeutic application of the ray should be intrusted only to the hands of operators who are skilled and experienced in this particular line of work, where it is possible to secure such, as the difference between efficient and faulty technique will frequently constitute the difference between success and failure in clinical results, as well as between safety and danger to the patient.

**DISCUSSION.**

Dr. J. D. Gibson said that reference had been made in the paper to the plan of exposing uterine cancer by means of a speculum, and the author had described a method which he considered preferable. In his own experience he had met with difficulty in preventing burns in this class of cases. Two cases in particular had caused him a great deal of trouble, and in the future he would give a thorough trial to the method described by the reader of the paper, in which a speculum is not used. His experience had been that in superficial cancers the best results were obtained from the use of very soft tubes and close exposures ranging in length of time from seven to ten minutes. In one or two of these cases he had used the high-vacuum tube, and while this had caused considerable reaction on the part of the patient, the cancer had not seemed to improve so rapidly as when this treatment had been discontinued and the soft tube used. This change was especially noticeable in one case. In a case, for instance, of cancer of the pharynx or tonsil, especially with much involvement of the lymphatics under the jaw, the patient would continue to suffer from pain in the mouth, although the external surface showed signs of improvement. This demonstrated the necessity of using the high tube in order to secure greater penetration. He hoped to bring out in the paper that he was about to read that there was place for tubes of all grades of hardness.

Dr. Roberts of Lexington, Ky., thought this question of the kind of tube to be used should be thoroughly discussed. His personal experience had been that with the soft tubes the results were not good, especially if the tissues were much involved. The tube must be strong enough for the rays to penetrate to the deeper tissues: with the soft tube only the superficial tissues were affected.

Dr. R. J. Nunn said that although his remarks might not seem exactly pertinent at this point, he wished to say something regarding the uncertainty with which we speak of tubes! It was entirely unscientific to speak of "soft" tubes and "hard" tubes; it would be far better to speak at once of the penetrating power of a given tube and of the apparatus used for the generation of the X-ray. He hoped in due time the committee on meters would take up this subject. There could be no special difficulty in constructing a meter of metal or some other appropriate substance by which one could measure more definitely the varying qualities of the different vacuum tubes. To speak of a tube which could penetrate a block of tin, for example, of a certain thickness, would be far better than the present inexact method of describing tubes.

Dr. Albert C. Geyser said that there was absolutely no posi-

tive way of describing the penetrating power of a tube, because it did not remain the same from hour to hour. It was well known that the vacuum continually worked higher, and it was for this reason that the tube was baked or some chemical was used to lower the vacuum. There was, however, an invaluable way of distinguishing a hard tube from a soft tube. When a tube gave a green fluorescence it was a high tube; when there was a blue color the tube was known to be soft. The longer the tube was used after the blue had disappeared the harder would the tube become.

Dr. William B. Snow said that Dr. Skinner deserved a great deal of credit for introducing this subject of high tubes, as he was the first writer to give the matter prominence. We must all come eventually to the use of high tubes for work upon the deeper tissues. With the static machine it was easy to determine the vacuum of a tube by the spark-gap. If the balls of the discharging rods were placed near each other, the interruptors were closed at either end and the balls then slowly separated, when the tube began to radiate with the balls a certain distance apart, the tube was of relatively high or low vacuum, marked by the length of the spark-gap between the balls of the discharging rods. He disliked very much the terms "soft" and "hard"; the terms "high vacuum" and "low vacuum" were more correct. A tube that required a no longer spark-gap than one inch and a half with the ordinary exciter he considered a low tube, while a tube requiring over a four-inch spark-gap he considered a high-vacuum tube. This matter should, of course, be standardized. With coils it was not so easy to determine the vacuum. The difficulty with Dr. Nunn's idea was that one person would consider the metal or meter to be penetrated, while another would not agree that it was, and the measure would not be definite. He believed with Dr. Skinner that it made very little difference who manufactured the tube, provided a certain quality of radiance was obtained. Durability and controllability were important factors, however, to be taken into consideration. A fairly large bulb was advisable, because the vacuum changed very much less rapidly in it than in one having a small bulb, because in the latter there was very much less air to be affected and the vacuum was relatively little affected. He thought that in some cases one might do good work through specula, and personally he was disposed to make use of an aluminium speculum, which would be fairly transparent to the rays. At the present time he was treating two cases of cancer of the uterus with the speculum, using the ray above the abdomen immediately following the raying through the speculum.

Dr. G. Betton Massey said he wished to express his full sympathy with the work that had been done by Dr. Skinner

in the treatment of these cases, and in the effort to settle many mooted questions. As a result of personal experience in the treatment of cancer by various methods, he was convinced that, even if more than he claimed for the cataphoric treatment were true, there would be still an immense field for the X-ray treatment of cancer. In the first place it was so much easier of application, and it would be useful in cases in which the area would be too great for the successful application of the local method. Sarcomata were always so widely diffused that it was inconceivable that any truly local method could possibly effect a cure—the knife, cataphoresis, or any other method. We were compelled, then, to fall back in such cases upon the X-ray. Then, too, in the cases of recurrent carcinoma of the breast, particularly after the use of the knife, the disease was so extensively disseminated that a cure could not possibly be effected by purely local means. In this connection he would say that cancer *en cuirasse* was a common result of intervention with the knife. It was in just this class of cases that wide and deep penetration, such as appeared to be obtained with the X-ray, was particularly valuable.

Dr. Robert Reyburn said that for a number of years he had made use of the knife in the treatment of cancer, but of late years, because of the almost inevitable return of the cancer, he had become discouraged, and had felt like abandoning the use of the knife altogether. But now had come in the treatment with the X-ray. He believed the reason the knife failed was that, as cancer was always diffused beyond the part visible to the unaided eye, the knife laid open fresh channels for infection; therefore, he considered the knife a failure. In cases of tuberculosis of the neck, one gland might become infected and remain unchanged for years, and no dissemination of the disease take place unless breaking down occurred. His belief was that by the X-ray the cancer cells were destroyed, and these cells he believed were nothing more than erring epithelial cells. This belief found strong support in certain experiments that had been made in England. The X-ray probably not only destroyed the cancer cells, but also established a protecting wall against further infection; in other words, the X-ray acted very much as do caustics. The caustic treatment of certain cases of cancer was even at the present day a very popular one with certain well-known surgeons, and probably for this reason. The X-ray possessed the important advantage of giving, in addition, a far better cosmetic effect, and also enabled one to reach the disease in otherwise practically inaccessible regions. He thought the penetrating powers of the X-rays were altogether underrated. Two or three years ago he had read a paper before this association, showing that the X-ray could penetrate great thicknesses of

metal. He understood that this method had been used by the United States government to detect defects in the armor plates for naval vessels.

Dr. C. R. Dickson said that he had seen described a novel method of measuring vacuum tubes. The apparatus consisted of two revolving disks containing holes on its periphery which were covered with a varying number of thicknesses of tin foil. When the two disks were revolved in front of an opening opposite the observer's eye, it was easy to determine the number of thicknesses of foil which could be penetrated. A scale was provided for reading off the result in figures. He would like to know whether anyone present had had any experience with this method.

Dr Skinner closed the discussion. He said that two years ago Dr. S. H. Monell of New York had devised an arrangement acting on the same principle. The apparatus consisted of a metallic plate of sufficient thickness to be impenetrable to the X-ray, and of two intersecting wires back of it. An opening was provided for observation, and sheet after sheet of tin foil was turned down between the opening and the wires until the latter were no longer visible with the fluoroscope. The result was read off in figures representing the penetrating power of the tube tested.

With regard to the discussion, Dr. Skinner said he was inclined to agree with Dr. Reyburn as to the way in which the X-ray produced its beneficial action on cancer, *i. e.*, by an influence on the surrounding cells by which the disease is walled off from the rest of the body. He had had a number of cases in which, although the tumor had not diminished much, the patient became perfectly well as far as constitutional symptoms were concerned. All of the cases mentioned in the paper were treated with the Morton-Holtz-Wimshurst machine of twelve plates, and the effects were such as to lead him to hope that a stronger ray from a larger machine would be still better. Accordingly he had just secured a machine having sixteen plates.



## Editorial.

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### **WILL PHYSICIANS GENERALLY INTRODUCE ELECTRICITY INTO THEIR PRACTICE ?**

EVENTS transpiring during the past year have awakened a new interest in the employment of electricity in medicine. The publication of the successful employment of the X-ray in the treatment of many conditions has caused many to give it consideration who have heretofore absolutely ignored the fact that electricity in any form was of therapeutic value, except as they would recommend it in a hopeless case.

It has been the experience of physicians in good standing who were employing electricity that a class of conditions which proved intractable to all other measures were sometimes referred to them by their brother practitioners. Patients suffering from chronic rheumatism, rheumatoid arthritis, sciatica, locomotor ataxia, are advised occasionally to try electricity, often without a thought that it will really benefit them, but for the sake of pacifying a solicitous patient. The electro-therapeutist set to the task of curing the incurables has often succeeded beyond the fondest hopes of the patient, and greatly to the surprise of his former attendant. That these conditions can be affected by electricity is no longer a question of doubt with many who have become familiar with its employment, and already many, previously skeptical, are beginning to realize that there is much to be accomplished with this valuable agent, but those who are not familiar with its employment look upon it as a means requiring much application, which is true if they would become expert. When we realize the fact that electricity, as employed ordinarily by the physician, is only a relative term, calling for many qualifications which will discriminate as to the character of the currents employed for effects and methods of application, the subject is, indeed, a technical one. Many who have used electricity for years and are enthusiastic in its use for various conditions, employing methods which they have found effective, have little knowledge of many of its broader fields of application. Indeed, he who would keep pace with the growing science of electricity in

any field must be alert, or he will fall out of the race in the march of progress. We would not by this discourage those who know little of the art of applying electricity in therapeutics, but arouse an interest in the subject which will lead to careful investigation. Probably no agent employed to-day by the physician is more safe in the hands of the man not technically conversant with its application, than what is designated as "static electricity." The currents and other modalities derived from the static machine may be considered absolutely harmless. It may be said, in other words, no agent is more harmless in the hands of a novice than a static machine. He may, if unfamiliar with its employment, make it very unpleasant for his patient, but will never endanger his life, because, while the voltages are very high the quantity of current is so very small that the element of danger is entirely eliminated. In addition, it may be truly said that few measures in the armamentarium, medical or physical, offer so great possibilities for the relief of human suffering as static electricity scientifically applied.

Its application is limited to no specialty, and no specialty is complete without its addition as a means of relief. This true, it behooves not only the general practitioner, but the specialist as well, to consider it when investigating means for relieving his patients.

The knowledge essential to the successful employment of this valuable therapeutic agent does not require the expenditure of as much time as is generally supposed. By this it should not be inferred that a physician can perfect himself in its application, but obtain the essential facts, which will enable him to develop a skillful technique from his own employment of it in the treatment of his cases. We believe that if these facts were appreciated, few indeed would hesitate before introducing its use into their practice. It is the uncertainty of the physician of his ability to grasp the subject which deters him often from undertaking the employment of this form of electricity. It is better that a physician should begin the use of the static machine with no knowledge, except the instruction which he may obtain from the manufacturer, than to neglect its introduction into his work. He would then accomplish some results that he would not other-

wise, which would soon lead to a thorough investigation and study of method.

Producing, as it does, the X-ray, with all its possibilities as a therapeutic agent, added to the therapeutic effects of the various static modalities, makes the static machine indispensable to the armamentarium of the up-to-date physician and surgeon.

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### **NEW DEPARTMENT OF PSYCHIATRY.**

**W**ITH this issue, a new department is added to the JOURNAL OF ADVANCED THERAPEUTICS. The subject of Psychiatry, or what Dr. Sidis calls the "Psychology of Suggestion" in its relation to the treatment of disease, either as a primary or intercurrent factor, is steadily forcing itself to the front, both in this country and abroad. The day for doubt or even speculation as to its great value as a therapeutic agent belongs to the past. Progressive physicians everywhere are coming to recognize its importance, and many are utilizing its advantages in their professional work. Whatever element of doubt may still remain is less as to the merits of psychic suggestion *per se* than as to its limitations. Obviously this point can be determined best and only by individual investigation. The world owes a great deal to individual enthusiasm along various scientific lines. This is pre-eminently true in the profession of medicine. The fact that the enthusiastic investigator has claimed too much for his method on the drug he would introduce to professional favor, does not constitute a valid reason for its absolute rejection.

Nearly every drug that has demonstrated its usefulness and been accorded a place in our recognized works on therapeutics, was originally introduced with claims that full investigation did not sustain. The history of advances along all lines is substantially the same. It requires enthusiasm to produce the best results. We should not be deterred from investigating the merits of a method of treatment because some of its champions have in the exuberance of their enthusiasm made exaggerated claims in its behalf. If underneath it all there resides a principle which, if correctly applied, assists, either alone or in conjunction with other methods, in the cor-

rection or cure of physical derangements, as scientific and progressive physicians we should utilize it for the benefit of our patients.

Standing for advancement in therapeutic methods and free from partisan bias for or against any agent or method claiming curative powers, the addition of a department of Psychiatry to this JOURNAL seems eminently proper. This department will be edited by Dr. Maurice F. Pilgrim of Boston, who, though for years a student of psychology, has still maintained a lively interest in and utilized other therapeutic methods, and was elected first vice-president of the American Electro-Therapeutic Association at its last annual meeting. Readers of the JOURNAL may, therefore, expect that this department will be conducted on broad lines and become a valuable contribution to the general advance that is taking place in therapeutic methods.

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#### **NEW DEPARTMENT OF DIETETICS.**

WE are pleased to announce that with this issue of our JOURNAL Dr. Sigismund Cohn, Professor of Dietetics and Diseases of the Stomach, assumes control of the department of Dietetics.

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#### **PERSONAL.**

IN our last issue we presented the portrait of our esteemed collaborator Clarence E. Skinner, M. D., LL. D., secretary of the American Electro-Therapeutic Association, and in the following issue will appear that of the president, Dr. Daniel R. Brower.

## Progress in Physical Therapeutics.

### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.  
ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### *Electricity in Gynecology.*

This subject was recently discussed by W. H. White before the Suffolk District Medical Society (Boston Med. and Surg. Journ., August 7, 1902, p. 148), the speaker giving a historical summary of the methods, with advice on the purchase and use of apparatus. He makes the following recommendations concerning treatment:

Relaxed tissues are best strengthened by the sinusoidal current, given as strong as can be borne without pain, using the bipolar vaginal electrode for about ten minutes. In displacements I use a special electrode of my own, which is placed against the ligaments, first on the right ligament and then on the left, with the pad above the pubes for retroversion and the pad at the back for anteversion, keeping the uterus in position between treatments by tampons.

Amenorrhea.—The galvano-faradic current applied ab-domino-dorsal on pad applied to each, or an intra-uterine electrode with abdominal pad about 20 m., 40 volts for ten minutes.

Menorrhagia.—If uterus is enlarged the positive intra-uterine application with a large abdominal pad 300 cm., strength of current about 25 m., 40 volts.

Metritis or enlarged uterus from neglected subinvolution.—Use the negative intra-uterine electrode, with a large abdominal pad as the positive, giving current as strong as can be borne, 30 to 50 m., about 40 volts; this causes a bloody serum to exude which continues for one or two days, if you put in ichthylol tampons after the treatment.

Ovaries.—Ovarian inflammation or congestion is treated by the carbon ball electrode for the anode placed in the vagina as near to the ovary as possible, with a pad 75 to 100 cm. for the cathodal pole on the abdomen over the ovary, using a current of about 10 m., of 30 to 40 volts, for about ten minutes. If the case is more acute the high-tension, long, fine wire with the same electrodes will relieve the acute symptoms.

Salpingitis.—The pain is relieved by using either the high-tension or sinusoidal current with the bipolar vaginal elec-

trode. In subacute or chronic cases the intra-uterine electrode passed into the uterus and turned to the tube to set up a drainage relieves the congestion. The amount of current varies with the amount of inflammation. Do not make the treatment painful; the amount of current may vary from 20 to 50 mam. In gonorrhreal salpingitis you can use copper or silver-tipped electrode as positive, getting the action of the oxychloride of those metals.

Tumors.—The treatment of tumors by the continuous current was considered the most conservative treatment, but the improved methods of surgery, with a decided reduction in mortality, now seem in most cases preferable. The electrical treatment is so very slow and long drawn out that I should not recommend it except in some cases which for various reasons may be inoperable. It is seldom that a uterine tumor is reduced in size while symptomatic cures—relief of pain, and checking of hemorrhage—are usual. The intra-uterine electrode used as the anodal pole checks the hemorrhage; otherwise this electrode would be used as the cathodal pole, with a large pad of about 600 cm., with a current of 50 to 100 mam., or possibly more. Treatments are once in four or five days or a week, and extend for a year or more.

In the discussion on this paper Dr. F. H. Davenport recommended electricity in sterility, but said that his experience in the use of this remedy had been mainly limited to a brief trial of the Apostoli method when it was first introduced, and he wondered whether this method was still used in the treatment of fibroids. Dr. White, replying, stated that he saw less mention of the method of late in French electro-therapeutic literature.

[Dr. White's position concerning the relative value of electricity and the knife in fibroid tumors does great injustice to the claims of the former. In considering questions of this nature it should be remembered that the quiet, conservative workers in electro-gynecology are rarely great shouters at the medical societies. Comparative lack of vigorous assertion may therefore lead to false conclusions concerning the present use of the method. To our own knowledge the method is in very large and satisfactory use, and but little is said or written concerning it, because its technique and value are pretty well understood. The length of time required for the most satisfactory results is its chief obstacle, and when intelligent and patient gynecologists with a training in electro-therapeutics are found in every town, this ob-

jection becomes very slight indeed, for the patient need not then leave her home, and during the treatment enjoys a progressive restoration to health. To lightly contrast this state of affairs and possibilities with the knife operation is most unjust unless we state frankly that the operation is far more fatal than Dr. White admits. He is surely in error as to the three per cent. and one per cent. mortality mentioned by him in an unquoted portion of the article. But even if the mortality stood at these figures the patient should be informed of the grave results usually following successful cases: the nervous symptoms due to castration, the bowel obstructions so common, and the rupture that is almost invariable and that produces a tumor on the outside of the body made up of elements of far more concern to the patient than the original fibrous lump.—G. B. M.]

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## DISEASES OF THE ALIMENTARY CANAL.

EDITED BY WALTER H. WHITE, M. D.

*Hyperchlorhydria.* Max Einhorn, M. D., in Am. Medicine, June 21, 1902.

By the term hyperchlorhydria is meant the condition in which the gastric secretion is abnormally strong and accompanied by manifold subjective symptoms. The question at what degree of acidity of the gastric contents hyperchlorhydria begins is not so easily answered. While physiologically the gastric juice at the height of digestion usually shows an acidity varying from 40-60, instances are found frequently in which deviations exist in both directions. For this reason we speak of hyperchlorhydria merely if the hyperacid gastric juice is accompanied by various dyspeptic symptoms. A degree of total acidity above 70 or of free HCl above 50 marks the point at which this abnormal condition is liable to cause symptoms.

He says that, according to his statistics, over half of dyspeptic patients are afflicted with hyperchlorhydria. It occurs more often in the prime of life, while in infancy and old age it is least prevalent. It is very frequently found in chlorotic individuals, and almost always accompanies ulcer of the stomach. The factors that are liable to produce hyperchlorhydria are mental strain and worry; students working hard to pass their examination, stockbrokers who speculate a great deal, persons who worry over long illness or death in the family, etc., are often troubled with hyperchlorhydria; the

abuse of alcohol and tobacco, too highly spiced foods, eating very fast and gulping the food down in big lumps, may also cause hyperchlorhydria.

At the height of digestion the gastric contents show a large percentage of acidity, caused by free HCl. In the fasting condition the stomach is empty and the motor function, as a rule, is not impaired, the stomach emptying at the right time (about two hours after a small, six hours after a large meal).

While during the meal and for a short period afterward there exists a feeling of perfect euphoria, about an hour or two later manifold symptoms appear. There is either a feeling of uneasiness or pressure in the epigastric region or frequently heartburn accompanied by pain of a more or less severe character. Frequent eructations of gas and occasionally waterbrash annoy the patient. In some of the cases nausea, headache and dizziness exist, either alone or associated with the disturbances just mentioned. The ingestion of food or drink almost immediately gives relief to the symptoms for a short while. At the time when the stomach is empty these patients are free from symptoms. The appetite is usually not impaired, in some instances it is exaggerated, in others again somewhat decreased. Sleep is usually not disturbed. In almost half of the cases there exists constipation of a more or less high degree. Only a small percentage are afflicted with diarrhea. Both the constipation, as well as the diarrhea, are dependent upon the hyperchlorhydria and are relieved by a treatment of the primary condition.

The diagnosis of hyperchlorhydria can frequently be made by the existing subjective symptoms; discomfort or pains, appearing one or two hours after meals and alleviated by the ingestion of food or liquid or alkalies, speak most prominently in favor of this condition. The diagnosis, however, is only a probable one, not yet positive. In order to make it decisive, it is necessary to examine the gastric juice at the height of digestion. If too great acidity (caused by HCl) is found and the just-mentioned subjective symptoms prevail, the diagnosis of hyperchlorhydria is positive. There are rare instances in which the symptoms of hyperchlorhydria exist and also improve on an alkaline treatment without the presence of hyperacidity. For these cases the name "hyperchlorhydria spuria" seems to be appropriate. It is understood that hyperchlorhydria as the only affection in question will be assumed if an organic lesion (ulcer of the stomach) can be excluded. The latter is accompanied frequently by hyperacidity, but in these instances the hyperchlorhydria is only a concomitant factor in the disease, and not the primary affection, and for this reason treatment will be determined by the original disease, and not by the hyperchlorhydria.

The prognosis is generally good. There are but few cases which resist all kinds of treatment, and for these in most instances complications (either some organic lesion of the stomach or of the central nervous system) must be looked for.

The diet for hyperchlorhydria is yet a subject of great controversy. Some clinicians forbid starchy foods entirely and nourish their patients principally on an animal diet. Their reason for forbidding the starches is that the amylolysis in hyperacidity is greatly diminished, the acid checking the conversion of starch into sugar quite early. There is, on the other hand, quite a number of well-known clinicians who forbid meats to patients with hyperchlorhydria on account of their property to produce an increased flow of gastric juice. They prefer a milk diet and the carbohydrates.

Another controversy exists with regard to the frequency of the meals to be advised. Some institute two meals daily with the idea of giving the stomach a long period of rest between meals; others again prescribe frequent meals, their object being to diminish the too great acidity existing at the height of digestion by the addition of another small meal and thus diluting the contents.

When such differences of opinion exist, personal experience appears to be of some value. I am in favor of frequent meals, three larger ones (breakfast, lunch, and supper) and two or three smaller ones (consisting only of milk and bread and butter). The larger meals should consist of foods commonly taken at these meals with the exception of acid, too greasy and indigestible substances. Meats and eggs (hard boiled) should preponderate, while all kinds of spices and too highly seasoned foods should be avoided. I always permit patients to take considerable quantities of bread and butter, especially of the latter. It is only within the last two to three years that butter has been found, according to investigations of Strauss and others, to exert a beneficial influence upon lessening the gastric secretion. My object in giving butter was, however, not with the intention of diminishing the gastric secretion, for formerly I knew nothing about it, but for the purpose of increasing the state of nutrition which in most cases is essential. . .

The physical methods of treatment consist of electricity and hydrotherapy. The intragastric faradization and also galvanization often exert great benefit. A wet compress over the stomach at night is also often useful. The same can also be said of cold ablutions followed by a good rubbing of the chest and back. Lavage of the stomach is not essential in this trouble. Spraying the stomach with silver nitrate or protargol, or powering it with suprarenal glandular extract, have appeared to me to be of value in cases of an obstinate character.

Within the last few years gastroenterostomy has been recommended off and on for the treatment of this malady. I do not generally approve of this surgical measure for this particular condition. I have several times seen cases in which a gastroenterostomy had been done for pyloric obstruction, but the patients suffered nevertheless after the operation from hyperchlorhydria, showing that gastroenterostomy does not always necessarily remove the trouble. Besides, patients with simple hyperchlorhydria, *i. e.*, not complicated with ulcer, almost always get well by simpler methods of treatment.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D.

*Cases of Prostatectomy, with Remarks on the Operation.* Paul Thorndike, Boston Med. and Surg. Journal, August 28.

The author is in favor of prostatectomy and reports a number of cases in which the supra-pubic operation was performed. He gives the details of the procedure used from Fuller and sums up his conclusions as follows: 1. That great relief can be given to all patients suffering from symptoms due to obstructing enlargement of the prostate, either by palliative or by operative means. . . . 2. That complete prostatectomy is always the operation of choice, because it is the only operative procedure which cures or gives uniformly good results, when successfully performed in proper cases. 3. That the best time for its performance is just as soon as palliative efforts have failed, or are manifestly impossible of execution, and before secondary changes in the bladder and kidneys, due to long-continued obstruction, have taken place. 4. That in those cases which come for surgical relief so late in the development of the pathologic conditions that the bladder and kidneys are extensively diseased, and the patient is manifestly exhausted by long-continued suffering, other less certain and perhaps less severe measures may be advised, instead of a complete prostatectomy; but that such a decision can only be and must always be made by the surgeon for the individual case, and cannot be made the subject of a generalization.

[Few indeed are the cases of prostatitis which cannot be very greatly relieved or cured by the static wave current; employing either a sound in the urethra or a metal electrode in the rectum.—EDITOR.]

*Treatment of Hypertropia of the Prostate by Light.* By Dr. G. Gautier of Paris.

Light gives curious results.

In the treatment of hypertrophy of the prostate, one can apply the negative phototherapy and the positive phototherapy, both either associated or not with the Röntgen rays.

In the spectrum exist chemical rays included in the blue part, violet or ultra-violet (negative) and the rays included in the red part and infra-red (positive).

The calorific red rays, thanks to the special lamps of two amperes with 110 volts directed upon the perineum and the inferior abdominal region, exercise a beneficent action upon the retention of the urine and hypertrophy of the prostate. The same lamps enveloped with a blue globe produce an amendment of the painful symptoms.

The double benefit—diminution of the retention of the urine and amendment of the spasmodic pains—added to the (raising up) relief of the general state of the patient, is obtained from the fourth or eighth sitting.

In three cases the utilization of the Röntgen rays in isolated application and upon the perineum, the patient upon the chair, the limbs strongly flexed, with a soft tube, through a speculum, has also shown itself very efficacious; but the results have been less rapid.

The advantages of the method for the cure of hypertrophy of the prostate are the following:

1. Augmentation of the vesical contraction.
2. Rapid disinfection of the bladder as by an aseptic treatment.
3. Evacuation less frequent and more abundant.
4. Amendment of the pains of micturition.

With young patients this is a treatment worthy of attention, capable of hindering the evolution of prostatitis; with old patients it is a palliative method, but of an incontestable value every time when there does not exist nearby or distant infection.

Prolonged tests are necessary before setting up stronger conclusions, it being possible to have from one year's practice but summary impressions.

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*The Aetiology of Prostatic Hypertrophy.* G. Frank Lydston, Interstate Medical Journal, St. Louis, September.

Lydston remarks that the prostate, while in some respects to be considered as an involuntary muscle, is anatomically and functionally a sexual gland. Its relation to micturition is accidental, and we must look to perturbation of the sexual function for the explanation of its hypertrophy, especially of the pathological disturbances not directly due to traumatism

or infection. He considers prostatic hypertrophy largely due to overstrain of the organ during the period of its greatest sexual activity, causing glandular proliferation affecting the tissue and muscle hyperplasia. If this persists for a long time it is followed by permanent enlargement. Ungratified sexual excitement as well as sexual excesses may be the cause, and the changes come on earlier in life than we should suppose. In a large proportion of individuals the overgrowth occurs, as a rule, before middle age, but the residual urine does not accumulate until the bladder walls have become atonic from the physiologic changes of age and the insidious effects of unnoticed obstruction. Its occurrence in advanced life from overstrain at an earlier period is explainable on the same grounds as the development of arthritic disturbance in men beyond middle age at the site of a traumatism. Inflammation, gonorrhreal or otherwise, is an important factor. He considers senility, gout, and rheumatism as not exciting but as determining factors in so far as they promote irritability of tissue, a tendency to connective tissue proliferation, inelasticity of tissue, and in case of the diatheses mentioned, hyperacidity of the urine with frequent micturition. General atheroma may cause enlargement and sclerosis, but this should not be classed as hypertrophy. Disturbance of micturition per se is not the cause, but when it arises as the consequence of prostatic hypertrophy, it reacts on the diseased organ, enhancing the pathologic condition. In normal old age the prostate should atrophy and, if it does not do so, it is due to sexual overstimulation and frequency of hyperplasia from the causes mentioned. Neither the human male or female is, on the average, perfectly healthy sexually, and careful rectal examination of men from the age of twenty upward shows that a normal prostate in size, consistency and sensibility is the exception rather than the rule. He thinks we should overhaul and remodel the nomenclature of prostatic disease. As now used the term prostatic hypertrophy is an omnibus term covering a number of different conditions. When this has been done we will hear less of total prostatectomy and more of enucleation of prostatic tumors.

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### LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.,

*The Rhinologist, an Important Factor in the Prevention of Tuberculosis.*

The function of the nose is to warm, moisten, and cleanse the air inspired by the lungs, and it thus forms an important

factor in the human economy. It is therefore the duty of the rhinologist to teach the great importance of correcting abnormal respiration.—F. M. Pottenger, *The Laryngoscope*, June, 1902.

While catarrh does not run into consumption, as is generally understood, nevertheless it is a predisposing factor of great importance. Mucous membranes which are affected with chronic catarrh possess a lessened resistance and are often the seat of small abrasions, which offer an easy entrance to the tubercle bacillus.

Aside from his duty in keeping the upper air passages healthy, so that infection may take place less readily, the rhinologist has a special mission in early diagnosis. It is to him that patients suffering from tuberculosis in the early stages are apt to come for relief from a slight persistent cough, especially after talking or laughing. Coughs which do not yield to appropriate treatment in a reasonable time should be branded as suspicious. The temperature of these patients should be taken. A two-hourly chart required of them for a few days may give most important information.

It is of the greatest importance to the patient afflicted with tuberculosis that he find it out at the earliest date possible; so, where there is suspicion, all methods should be exhausted to find out the truth; and, fortunately, we have at our command means which make an early diagnosis possible in the majority of cases. With a thoroughly trained ear, the tuberculin test, the Röntgen rays, and the microscope, there is no reason why cases should pass on to the stage of consolidation before they are detected; and, with the first two, most cases can be detected in the prebacillary stage.

The chances of recovery for the tubercular patient decrease as time passes. In the early stage of the disease, from sixty to ninety-five per cent. of the cases are being cured. Turban of Davos says of those in the very early stage that ninety-seven per cent. should be cured. How hopeful this disease, then, if only an early diagnosis is made!

Therefore the rhinologist must assume a twofold duty in the fight against tuberculosis; not only to prevent infection, but also to recognize the disease in its incipiency when it is curable.

*Developing the Muscles of Respiration.*

In selecting the form of exercise, Dr. Albert Abrams (American Medicine, March 22, 1902) does not favor any attempt to develop the thoracic muscles individually. Whatever the character of the exercise it should include the general muscular system. While it is undoubtedly true that expansion of the lung is most evident when the movement of the overlying chest wall is most pronounced, it is equally true that overdevelopment of the thoracic musculature conduces to fixity of the chest. Feebly developed thoracic muscles do not indicate a diminished vital capacity, for, after all, chest mobility is more easily influenced by expansibility of the lungs than by the action of the thoracic muscles. He has made many spirometric measurements, and finds that when the thoracic muscles are excluded in the chest expansion, as far as possible, the spirometer shows results nearly as good as when they are actively engaged in lung expansion. Breathing exercises do not necessarily influence respiratory action directly. The results achieved are due in the main to the removal of peripheral resistance, thus increasing the arterial circulation, to relief of venous congestion owing to the increased quantity of blood in the arteries and to diminished work of the heart owing to free circulation of blood in the arterial system.

The heart is the mainstay of lung development. Like any other muscle, it owes its vigor to the activity of respiration. The exceptional muscular strength of insects is no doubt due to the fact that they respire from nearly every part of the body. Inordinate muscular exercise cripples the heart, while judicious exercise strengthens it. Whatever the nature of the muscular exercise we must always bear in mind that the slightest evidence of dyspnoea or palpitation is a signal of danger and demands interdiction of the exercise. The ideal exercise is swimming, which conduces to equal development of the muscular system, limits the danger of overexertion, and secures the tonic influence of the water on the skin.

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**DERMATOLOGY.**

EDITED BY ALBERT C. GEYSER, M. D.

*Treatment of Plain Angioma, Angiomatous Spots by Currents of High Frequency.* By M. Bergonié (Bordeaux), Archives d'Électricité Médicale.

He recalls the success of electrolysis in the treatment of angioma by the bipolar method, which he has previously recommended. These successes are to-day confirmed; whatever be the mass of angiomas, and whatever be their depth,

electrolysis is recognized as being the chosen procedure. It is not thus, however, when the plain angiomas or angiomatic spots spread only over the surface and do not rise above the skin. For these cases, the new method praised by the author, and which has given him excellent results, consists in applying the electric spray or effluve, mingled with small but unmerous sparks proceeding from the secondary solenoid of an apparatus of high frequency to the level of the patch to be treated. The violet tissues whiten after several seconds of this application, an inflammatory reaction more or less intense takes place, and heal under treatment with epidermis more or less discolored. Every skin is more or less sensitive, so is also the regulation of the intensity of the current and the determining of the length of the sittings a delicate matter; if the aim is to be obtained without overstepping it, that is to say, to obtain as healthy a color as the neighboring skin. In the water color paintings accompanying this work, patches can be seen in all the different stages of treatment. The treatment is neither painful nor very long. According to the author it gives excellent results.

#### *Discussion.*

M. Guilloz.—He has treated by the same method acne rosacea, and has obtained nothing but good results. By the applied treatment he provoked the bursting of the capillaries.

M. Luraschi has treated in the same manner, deriving from the large solenoid of Arsonval electrical sprays, by means of an electrode similar to those used with the electro-static machine. He has thus been able to obtain good results in cases of dilatation of the veins.

M. Beclere asks, if, in the treatment which was just being indicated by M. Bergonié, there was no ground to attribute a part of the results obtained to the ultra-violet rays issuing from the effluve?

M. Laquerriere thinks that there is no such ground, according to a recent discussion at the electro-therapeutic society.

M. Kurella does not admit in this case the action of the ultra-violet rays. The direction of the ultra-violet rays is, in fact, perpendicular to the direction of the electrical discharges; it is thus that it passes for the electrical arch and for the discharges of the condensers.

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#### *The Action of the X-rays upon the Skin.* By M. Sala, Pavia.

He has made experiments with reference to the influence of the X-ray upon the skin of animals (cobayes and rats) in order to solve the following problem: Is the changing of the skin and hairs of animals caused by the alterations of the peripheral nerves and the central nervous system?

To determine this question, white rats were submitted to the X-rays for twenty minutes and cobayes for thirty minutes, the exposed region each time being the abdomen. The region was protected by a grilled screen of lead; distance, twenty-five centimeters; duration, variable; intensity of the current inductor, four to five amperes.

This histological examination has shown no change either in the marrow or in the surrounding nerves.

An important fact is announced by the author: the black hairs of an animal are replaced by white ones.

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## RADIOGRAPHY.

EDITED BY HERMAN GRAD, M. D.

*Fractures of the Extremities.* G. G. Ross, M. D., and M. I. Wilbert, Ph. G., Philadelphia Med. Journ., October 4, 1902.

We should like to add that the gradual improvement in the efficiency of the necessary apparatus and also in the technique of the various X-ray operators has done much towards increasing the available amount of data and knowledge concerning fractures, and especially in clearing up several little understood or disputed points. Among the points we would like to call especial attention to is the fact that this method of diagnosis has revealed the comparative frequency of more or less extensive bone injuries, at or near their articulating surfaces. This latter class of injuries, while a most important one from an economical point of view, has not received the attention that its importance would appear to entitle it to.

Despite the fact that the X-rays have been in use for upward of six years as an aid to the careful and scientific study of fractures and other pathological conditions of the osseous structure, many of the older and necessarily erroneous ideas are still being published in what purport to be modern treatises on fractures.

The number of cases of carpal fractures, reported by various observers in the medical journals during the past three or four years, would certainly indicate that this class of fractures is to be considered among the most common of the injuries at or about the wrist joint.

Among the carpal bones the scaphoid is probably the one that is more readily injured; while a clinical diagnosis of this particular fracture is quite possible, it is not always positive. It is usually characterized by slight swelling over the seat of injury and by more or less persistent pain, usually exaggerated by moving the thumb.

Carpal fractures are, however, but one of several classes of fractures that are often overlooked; the metacarpal, tarsal,

and metatarsal bones and the articulating surfaces of the long bones are all quite frequently the seat of more or less extensive injuries that are likely to be overlooked or not recognized in an ordinary clinical examination. Any or all of these injuries are comparatively more common than the available text-books would lead us to believe.

The character and location of joint fractures, the absence of crepitation or any marked deformity, all tend to render these injuries obscure and frequently make a positive clinical diagnosis impossible. Nevertheless, as noted in connection with fractures of the scaphoid, a persistence of pain, accompanied by circumscribed tenderness and swelling, should give rise to a suspicion of a more or less grave injury to the osseous portion of the joint. If, for any reason, treatment has been deferred, for eight, ten, or twelve days, the injury is likely to be complicated by either vicious union or excessive callus formation, any one of these may serve as an almost insurmountable obstacle to a subsequent complete restoration of function and may, on the other hand, lead to a more or less complete and permanent ankylosis, caused by the excessive proliferation and subsequent breaking down of the callus that has been thrown out, without having sufficient blood-supply to support or maintain it.

There appears to be a feeling among a large class of medical practitioners that little is to be gained from the routine use of the X-rays in the examination of the ordinary or uncomplicated fractures. The experience at the German Hospital does not coincide with this general opinion, for not only have a number of supposedly uncomplicated fractures proven themselves more extensive than anticipated, but, in addition to this, in several cases the injury was of quite a different character from what one would expect to find, judging from the history and physical signs.

The possible use of X-ray pictures as a basis of suits for damages for malpractice is another factor that has deterred many practitioners from using this means of verifying a diagnosis as often as they should. This peculiar antipathy is being overcome, however, by the knowledge that an X-ray picture can never be taken literally and that, to interpret a picture of this kind properly, we must be in possession of all of the accessory facts and factors. So that, while an X-ray picture is of undoubted utility as an aid to the proper diagnosis and treatment of an injury, it is not of itself satisfactory proof in all cases of the existence of such injury, nor does it indicate nor prove the nature of an injury or the probable results.

[We would add that the X-ray picture should be taken literally, and instead of such a picture forming the basis of

suits for damages for malpractice, it would actually protect the physician from such suits. It is only a matter of time and the courts will admit X-ray pictures as evidence.]

Of the 500 cases, 301 were of the upper, while 199 involved one or more bones of the lower extremity. Four hundred and twelve were in males and 88 in females. Two hundred and forty-four were of the right and 256 of the left-hand side of the patient. By far the greater number of this series of injuries occurred in patients between the ages of eleven and forty. The variety or kind of injury that is most common at the various ages is also of interest. We find, for instance, that in young children fractures of the elbow are comparatively more frequent, while in the next decade fractures of the wrist and arm assume more importance. From twenty to forty fractures of the ankle appear to be nearly, if not quite, as frequent as fractures at or about the wrist, and both of these diminish in comparative frequency, as with increasing years persons are less likely to expose themselves to the particular combination of circumstances that tend to produce these classes of injuries.

Of the phalangeal fractures there was one each of the first, second, third, and fifth fingers.

Of the metacarpal fractures there were 14 of the first, 10 of the second, 1 of the third, 3 of the fourth, 2 of the second and third, 2 of the third and fourth, 1 of the fourth and fifth, and 1 of the second, third, and fourth metacarpal bones.

At the wrist a simple or uncomplicated fracture of the radius was found in 38 of the cases. In an additional 33 cases this fracture was accompanied or complicated with a fracture of the lower articulating surface of the ulna. An injury to the ulna above what would correspond to the epiphyseal line was noted in 8 cases, and in 16 an injury to one or more of the carpal bones complicated the fracture of the radius, while in 5 additional cases the injury to the radius was accompanied with a fracture of the ulna and a fracture of one or more of the carpal bones.

The ulna alone was found injured in 4 cases, while in 2 additional cases the fracture of the ulna was accompanied by a fracture of the scaphoid.

In 23 cases there was a fracture of one or more of the carpal bones, making a total of 46 cases in which one or more of the carpal bones were injured in this series of cases.

Of the 21 fractures of the forearm, 13 were of the shaft of both bones, 6 of the radius alone, and 2 of the ulna.

Fractures of the elbow numbered 48 in this series. Of these, 43 include some portion of the lower articulating surface of the humerus. Three of these were accompanied by a more or less extensive injury to the coronoid process of

the ulna, and 1 by a fracture to the head of the radius. In addition to these there were 7 fractures of the olecranon, 1 of the coronoid process, and 2 of the head of the radius, and 1 of the shaft of the ulna below the coronoid process.

The shaft of the humerus was broken in 9 of the cases, while the same bone, at or near its upper articulating surface, was injured in 12, 2 of these including an injury to the acromion process of the scapula.

The acromion alone was injured in 11 cases, and in 4 more was accompanied by an injury to the acromial end of the clavicle. There were 10 fractures of the body of the scapula and 1 of the coracoid process. The clavicle alone was broken in 11 cases, and in 7 of these the fracture was near the acromial end or distinctly within the outer third of that bone.

The head and neck of the femur were fractured in 6 and the shaft of the femur was injured in 4 cases.

The 19 fractures at the knee included 5 of the lower end of the femur, 7 of the patella, 6 of the upper end of the tibia and 1 a fracture of both tibia and fibula, near or at the knee joint.

The 16 fractures of the leg included 11 of both bones, 4 of the tibia alone, and 1 of the fibula.

Of the 103 fractures near or at the ankle, 37 were of the outer malleolus, 20 included some portion of both bones, and 11 were of the lower end of the fibula. In addition to these, 7 fractures of the outer and 2 of the inner malleolus were accompanied by more or less extensive injuries to the tarsal bones.

The tarsus itself was injured in 26 cases, 15 of these being fractures of the os calcis, 6 of the astragalus, 1 of the astragalus and os calcis, and 2 each of the scaphoid and inner cuneiform.

The fractures of the foot, 50 in number, included 28 of the metatarsal bones, 5 of the metatarsal and tarsal, 3 were of the metatarsal accompanied by a fracture of one or more of the phalanges, and 15 were of the phalanges.

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## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D.

The question as to whether mental work can be accomplished under the best possible conditions in a room in which only the center of work, the writing-table, etc., is brilliantly illuminated and the walls comparatively dark, is variously answered by different observers. Katz finds in discussing the subject that some assert that it is better to have dark walls upon which the eye may rest in the intervals of work when it is fixed upon a brightly lit surface, as in reading or writing,

while others say that the transition from light to darkness is not a rest to the eye, but a positive strain upon it, and hold that the walls of a study should be well illuminated as well as the table. He holds to the latter view. He finds that working in a room illuminated by a lamp that is shaded so as to exclude light from the walls produces a depressing sensation in most individuals, and gives rise in many upon whom he has experimented to a feeling of lassitude and an irresistible somnolence. On the other hand, when the walls were properly lit there was a greater capacity for work with freedom from somnolence. This increased energy and freedom from somnolence increased in proportion to the brightness of the room. His study of the subject shows that the somnolence was not due to lassitude from the day's work, but was produced merely by the abstraction of the necessary light energy. The question is raised as to what it is in artificial light that is depressing to the nerves. Is it the incompleteness of its spectrum or the insufficiency of light as compared to darkness? Trivus, of Bechterieff's psychological laboratory, shows by experiments that various colored lights have depressing effects upon the rate and volume of the pulse wave. The nerves demand a certain amount of light for their activity, and as each color is but a part of the spectrum of the rays of the sun, it follows that colored light cannot give the same energy as white light. Hence, if a subject be placed in colored light, he suffers from what might be called "light hunger." Thus, yellow light being in the brightest part of the spectrum does not affect the pulse rate as much as violet light, which is the darkest part of it. The author believes, however, from his experiments on persons and their capacity for work in artificial light, that it is not the part of the spectrum that counts, but the insufficiency in the amount of light energy that acts to depress the brain and nervous system. The conclusion is reached, therefore, that the use of colored shades for softening the light in work-rooms and the centralization of the light in such a way as to leave the walls in semi-darkness, is wrong from the hygienic point of view.

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*The Prophylaxis of Sunstroke.* Journal of Topical Medicine, August 15, 1902.

From his personal experience of sunstroke in India Dr. Andrew Duncan gives details of a method of prophylaxis which has served him well: During several successive years he suffered from severe headaches, and during four hot seasons he had in addition intolerance of light and a tendency to unconsciousness.

Acting upon a suggestion made to him that the actinic rays, and not the heat rays of the sun, were the active agents

in producing sunstroke, and that the effect would be counteracted if the body were enveloped as a photographer treats his plates in an orange-yellow wrapper, he wore an orange-yellow shirt, placed a similar colored lining inside his service helmet, and inside the coat over the spine. The influence of the sun was never felt to be overpowering after the use of this colored material.

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*Electric Light Conjunctivitis.* Medical Press and Circular, April 23, 1902.

According to Grimsdale, this disease has received scant acknowledgment in our literature. Several cases are reported, with varying symptoms. The disease is not serious, lasting usually but a few days, and is greatly relieved by the use of cold compresses. It is the ultra-violet rays, and not the general illumination, which produce the effect, as is evidenced by one of the cases reported. It is thought that dark yellow glasses would be better than ordinary smoke tint, in preventing both this and snow blindness. The conjunctivitis can hardly be due to direct injury, as there is an interval of quiescence after the immediate results have passed before the acute symptoms come on. It must be due to the disturbance of the nervous system, especially the vascular centers, by direct stimulation of the afferent nerves, or the rays cause some chemic change in the conjunctiva whose products act as strong irritants, producing local inflammation.

[The effect upon the conjunctiva, pointed out by Grimsdale, is, without doubt, due to the influence upon the vascular centers. The influence of the high frequency waves or chemic waves of light upon the capillaries, as demonstrated by the experiments of Finsen, need only to be kept in mind to prove this assertion.—EDITOR.]

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*The Use of Sensitive Photographic Paper for the Photometric Estimation of the Light in Schoolrooms and Working Rooms.* Wiener Klinische Wochenschrift, July 17, 1902.

Eder advises using Andresen's rhodamin argentic bromide paper for estimating the yellow rays of light, especially in schoolrooms or workrooms. This he finds works best according to present photo-chemical knowledge. For photometry, as usually employed, ordinary argentic bromide or chloride sensitive paper is used, which measures the intensity of the blue, violet, and ultra-violet rays.

## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

*A Few Cases Selected to Show the Impetus Given to the Vis Medicatrix Naturæ by the Dry Hot-Air Treatment in Simple Wounds.* George Z. Goodell, M. D., Salem, Mass.

CASE I.—C. H. H., forty-four years old, punctured the palm of his right hand near the base of the thumb with a nail in a pork barrel while at his work as a meat cutter, causing septic poisoning resulting in abscess formation.

When I saw it, about four days later, the hand was swollen, red, and painful enough to keep him awake nights. January 16, 1902, one treatment in the small dry hot-air apparatus for half an hour, temperature going as high as 450° F., relieved all the swelling except in the immediate neighborhood of the abscess, relieved all of the throbbing pain, he slept that night without an opiate, and his hand healed in a few days.

CASE II.—W. S. L., thirty years old, jeweler, fell down the cellarway at his store and struck on the ends of the extended fingers of the left hand, causing pain, swelling, and some ecchymosis. January 18, 1902, six days later, ends of fingers still very painful and hand getting somewhat stiff from disuse, he consulted me and I gave the hand one treatment in the small dry hot-air apparatus for half an hour, highest temperature 455° F.

When the hand was taken out he could pinch all the fingers but one, which was cut a little, while before I put the hand in he could hardly bear to have me fold the towels about it, so sensitive were the fingers. He had no more trouble with the fingers.

CASE III.—E. C. M., forty-six years old, carpenter at Boston and Maine car shop, called me March 10, 1902.

While working out of doors that forenoon, wearing thick woolen stockings and rubber boots as a protection against the cold and dampness, the end of a heavy timber fell on his left foot, bruising it and breaking the skin a little without cutting either the boot or stocking. The entire foot and the leg up to the ankle was ecchymosed.

The patient could not use the foot and had to keep it very quiet to get relief from pain. I ordered a lotion for it, and on the next day, March 11, 1902, carried the small dry hot-air apparatus to the house and gave the foot a half hour's treatment, highest temperature, 300° F.

After the treatment he could walk about the room slowly, without much pain, and was back to work inside of a week.

CASE IV.—E. F. G., thirty-eight years old, housewife, on

the evening of May 24, 1902, hit the front of her right ankle sharply against the rocker of a rocking chair. Although it pained her severely for a while she slept all night, but on attempting to step on it in the morning the pain was so excruciating that she could not stand.

I took the small dry hot-air apparatus to her room and gave the ankle a half hour's treatment, highest temperature being 354° F. At the conclusion of the treatment the pain had all gone and it never returned.

In each of these cases but one dry hot-air treatment was given, although in the first and third another might have been beneficial.

The time of detention from business was shortened and the recovery hastened remarkably by this treatment in all these cases, and I think we certainly have in the dry hot-air treatment a means of promoting metabolic changes, reducing local oedema and preventing sepsis.

*Hot-Air Treatment in Gynecic Practice.* Jour. Am. Med. Asso., October 4, 1902.

Polano has long proclaimed the advantages to be derived from local application of hot air in the treatment of old, hard exudates, on which it has almost a specific action, as Dutzmann corroborates below. It affects an exudate like a hot cataplasm, only far more energetically. The effect is so vigorous that it has to be carefully supervised, as in one case he describes an exudate as hard as a stone, softened, and the moment for incision not being noticed the pus made spontaneous irruption through the navel and into the bladder. Hot-air treatment has also proved extremely valuable in the after-care of an evacuated exudate, in cases of infantilism of the female genitalia and in fresh gonorrhreal processes in the adnexa. He describes a case of the latter very favorably influenced by it. Fever is a contra-indication, and also endometritis, as serous and hemorrhagic discharges would be aggravated by it. He has previously published a case of actinomycosis of the abdominal wall, cured by this means, and Kehrer has reported the cure of a rebellious fistula in the abdominal wall consecutive to an exploratory laparotomy for tubercular peritonitis, with marked improvement in the general health. Polano has applied hot air in the treatment of gynecologic affections in Martin's, Lohlein's, and Pfannenstiel's services at Griefswald and Giessen. He restricts the heat to 120° or 125° C., beginning usually with 115° C., and removes the apparatus at the end of thirty minutes. He supplements the procedure with hydriatic measures as indicated, or wraps the patient in a blanket, after applying a cataplasm. He has used various apparatus and found Bier's simple box and alcohol lamp as effective

as any. He concludes by recommending Kehrer's incandescent-lamp apparatus for keeping patients warm during protracted operations, as a remarkably simple, safe, and effective contrivance for the purpose, deserving wide adoption.

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## HYDROTHERAPY.

EDITED BY CURRAN POPE, M. D.

Hydrotherapy depends chiefly on three stimuli for its results:

1. Temperature (heat and cold).
2. Volume (quantity and extent of application).
3. Mechanics (extent of impingement and force of impact).

Its successful application is dependent upon the ability of the physician to obtain satisfactory and proper reaction. In fact, it has been the writer's experience that this is the key-stone of the entire hydrotherapeutic arch, and that unless it is under the control of the operator the action of this agent is likely to be unsatisfactory. I reiterate here what I have taught and written for years, that not only must great care be taken that stimulation does not exceed the power of the organism, but that the supervision of such treatment by a competent and well-educated physician is a *sine qua non*. Each case is to be individually and specially considered and the needs properly met. While hydrotherapy is unquestionably one, if not the greatest, of all hydrotherapeutic weapons, the physician must not overlook the other valuable non-medicinal remedies that lie at hand in the shape of electricity, massage, rest, diet, and surroundings of the patient. One of the many things that recommend hydrotherapy is the fact that it does not interfere with any known internal medication. Winternitz found and established the neutral temperature to be 90° F., and to obtain any action or reaction the temperature of the water must be either above or below this neutral zone. Water is much more active than air in inducing a reaction at the same temperature, owing to its greater conductivity. It must not be inferred from the above that neutral baths (temperature 90° to 94°) are without therapeutic value, for this will be shown later when we come to consider special methods of application. The action of warm water applied to the general cutaneous surface is sedative. Where the application is sudden there is very likely uninital vasomotor contraction which passes off quickly, but where the application is slow the vaso-dilatation lasts during the application. This is accompanied with a feeling of warmth and a dilatation of the superficial blood-vessels. There is a notable increase in the secretion of the surface glandular struc-

tures and, as a rule, sweating takes place accompanied by a marked increase in the respiratory movements. The physiological effect of these conditions is to produce increased heat radiation by the vaso-dilatation; increased expiration of watery vapor; and increased loss of heat by sweating. The general effect, as has been stated, is sedative and it produces in addition a diminished desire for exertion, tendency to lethargy, and a certain amount of drowsiness and mental inactivity. Heat applications tend to constipation due to lessened peristalsis and a diminished intestinal secretion.

*Treatment of Obesity.* By J. H. Kellogg, Modern Medicine, July, 1902.

The writer calls attention to the fact that the most satisfactory way to reduce flesh is by restricting the diet, increasing the work, and exposing the patient to the influence of cold. He cites an interesting fact, however, that a cold bath of ninety-eight minutes is equivalent in reducing power to an active walk of twenty miles. The cold bath is the most effective means of stimulating oxidation, as four-fifths of all the oxidizable material which enters the body is consumed in heat production; one-fifth in work. The combination of cold and exercise, together with the reduction of diet, is best met by cutting off the food supply to one-half and having the patient swim in cold water at from 68° to 75° F. By a careful combination of methods the reduction in weight progressing steadily and continuously at the rate of three-fourths of a pound to a pound daily for two or three months may be obtained and is far safer and will leave more permanent results than any other known method.

Munter (Deutsche med. Woch., May 15, 1902) describes the scientific basis for hydrotherapy of tabes in its effect on the normal supply of blood and the course of the nerve stimulus. The function of the nerves is remarkably influenced by the blood supply. His experience has shown that the most effective means of treating the attacks of pain is with a bath of thirty to sixty minutes at a temperature of 95° F., with or without the addition of a little salt. The brief application of cold in these cases has a tonic, stimulating, and strengthening effect on the nerves. Tabes induces a peculiar sensitiveness to cold, and its prolonged application should be avoided. He advises baths three times a week, continuing them for a year or longer instead of crowding them into a short space; he rejects as injurious steam, sand, and electric-light baths. By a combination of hydrotherapy with other measures it may be possible to arrest the degenerative process and provide a substitute for the lost fibers by training the remaining intact elements.

[The editor called attention to these facts in an article published in the Medical and Surgical Bulletin, 1893, and in a recent article in the Alienist and Neurologist, current issue].

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## DIETETICS.

SIGISMUND COHEN, M. D.

*Rational or Dietetic Treatment of Bright's Disease Contrasted with Surgical Intervention.* By William Henry Porter, M. D., New York, Medical Records, September 27, 1902.

The *raison d'être* of this article is that it has been claimed, within the last two years, that Bright's disease can be cured by operative interference. As scientific therapeutics has for its aim, not only the removal of the symptoms, but the elimination of all the ætiological factors entering into the production of the pathological lesions, the author cannot believe that a surgical operation can alter these ætiological factors sufficiently to cure Bright's disease.

To fully comprehend the treatment of Bright's disease, a clear conception of the anatomy, the physiological functions of the kidney, the ætiological factors, and the pathological lesions produced by these factors, is absolutely necessary.

The author gives first a short résumé of the anatomy and physiology of the kidney, whose function is to eliminate the utilized and non-utilized proteids from the body. The utilized proteid is that which has passed through the various structures of the body, and, for a time at least, acted as an integral part of the various proteid systems; while the unutilized proteid is that portion of the proteid which is absorbed from the alimentary tract in excess of the absolute demands and requirements of the system.

The author gives three ætiological factors. The first is a deficient oxygenation of the proteids, produced either by insufficient supply of oxygen, or by overabundance of proteids, beyond the oxygenating capacity of the system.

As long as the work imposed upon the renal glands is not too great, and the nutritive supply is of the right kind and quality, the various structures of the kidney will maintain their normal integrity, but when for any reason there is insufficient supply of oxygen, or the amount of the proteids to be oxidized is augmented beyond the oxygenating capacity of the system, there will be imperfect oxydation reduction, or in some instances a portion of the proteid molecules will be isomerically transformed in the protoplasm of the excretory cells, and eliminated as such into the lumen of the uriniferous tubules. In the first instance, we will have a

reduction in the output of the urea with a corresponding increase in the uric acid; in the second case the albuminous substance will be transformed isomerically within the cell, and excreted therefrom directly into the lumen of the uriniferous tubules. This teaches us one important fact, that a close and careful study of the urine in regard to urea, uric acid, and albumin will show us the perfection or imperfection of the system, as far as its ability to transform the proteid molecules is concerned. As long as this condition is only transitory we may not find any pathological lesions, but it does indicate that one will follow sooner or later, if this abnormal condition is not corrected.

The second cause of degenerative changes in the kidney is found in the putrefactive fermentation so frequently met with in the alimentary canal. This condition results in the formation of toxic products, either formed in the alimentary canal, or produced within the system. In either case they are toxic. If the fermentation takes place in the alimentary canal, indican is formed, and is easily detected in the urine; therefore another danger signal is revealed by the examination of the urine.

The third and most intense cause of degeneration of the kidneys is the presence of micro-organisms, either in the system or in the food-stuffs, containing the proteid elements, while within the alimentary canal. In either case we will have toxic products, and the nutrition in general will be impaired, and the kidneys will have to perform an excessive amount and abnormal kind of work—hence their degeneration.

These three ætiological factors cause, if not corrected in time, pathological lesions, not only in the parenchyma, but also in the interstitial tissue. In both conditions we have a lowered nutritive activity and a disturbed nutrition, and we can readily see that the treatment of these lesions will practically be the same.

The author considers the treatment under two common headings, first, prevention, and second, of the cases which already show the symptoms of pathological lesions.

(1) As we know that the overworking of the kidney is caused to a large extent by over-eating and drinking, and more especially the former, great care must be exercised in the regulation of this point. As we also know (2) that renal lesions are caused by putrefactive changes in the proteids, during their passage through the alimentary canal, great care should be taken in regard to the quality of the food. (3) As the bacterial invasion is greatly facilitated by the lowered nutritive activity of the system, a strict observance of the diet in regard to quantity and quality, as outlined above, will eliminate the third ætiological factor.

Therefore, it becomes apparent that, practically, all forms of renal lesions (tubular or intertubular) are, to a large extent, dependent upon what the individual eats and drinks. Of course, we must not lose sight of the factor which produces an insufficient supply of oxygen, as lack of exercise in the open air, sedentary habits, unhygienic surroundings, etc.

Coming to the actually existing renal lesions, as evidenced by the finding of albumin casts, etc., in the urine, the dietetic rules, as outlined above, must be enforced even more rigidly, and it is by consistently following this plan that the author accomplished such admirable results. The author speaks of cases where the urine was free from albumin and casts not only for days and weeks, but for months and years, and the patient could be considered practically cured. Of course the tissue once destroyed cannot be replaced any more, and therefore these cases, viewed with the single eye of the pathologist or histologist, can never be cured, but speaking physiologically and clinically we may pronounce them cured. We should also remember that, owing to the inherent oscillatory nature of this class of diseases, there are exacerbations and remissions, and as long as the patient will observe the dietetic rules, the remission will continue, and he will be considered as cured, but a relapse into his old habits may bring on an exacerbation.

Coming to the details of the treatment, first of all, out-of-door exercise must be insisted upon, but care must be taken not to go to the extent of producing exhaustion. Exercise in sufficient amounts will increase the oxygenating capacity of the system, so that it will be enabled more perfectly to oxidize the proteid constituents. Attention must also be paid to the clothing. Undue chilling has to be avoided. The best results are obtained where the surface of the body is kept in a gentle perspiration at all times. Overwork of the muscular and nervous system, especially the latter, must be avoided.

The chief and most important treatment, however, consists in the perfect management of the diet, in accord with the principles outlined above. Here, as in all other diseased conditions, the author considers the well-regulated mixed diet as the ideal one to institute. He recites the general dietetic principles: first, the necessity of the inorganic elements; second, the heat-producing substances, carbohydrates and fats; third, the proteids, the tissue-building substances; fourth, the nucleo-albumins, in which the iron and phosphorous atom is combined with the proteid.

As the haemoglobin for the blood and the lecithin for the nerve tissue is formed by oxidation reduction out of the nucleo-albumin, the author considers this compound proteid

a most essential factor in the diet. For this reason the milk diet, so long extolled, in the treatment of renal affections, cannot be considered an ideal one, because it is deficient in nucleo-albumin. In like manner meats of all kinds, while tissue-builders, are also deficient in nucleo-albumin, consequently they are not ideal in their nature. According to the author, the animal kingdom is defective in nucleo-albumins, but more available than the same substances in the vegetable kingdom. The deficiency of the animal kingdom will have to be supplied by the vegetable kingdom. By doing so foods are introduced in the alimentary canal that contain an excess of starchy and saccharine compounds, which may easily undergo saccharine fermentation and putrefaction. Therefore our foodstuffs should be taken from both kingdoms, with preference of the animal, and the mixed diet will be the ideal form of nourishment.

The position which the author takes in regard to the nucleo-albumins is at variance with that of the majority of authors. The nucleo-albumins are compounds of proteids with nuclein. Nuclein is the chief constituent of cell nuclei, and if decomposed yields nucleic acid, plus proteids. The nucleic acid, if decomposed, yields the alloxuric or purine bases, which are closely allied, chemically, to uric acid. Experiments of Von Norden and others have shown that the purine bases are toxic, and it is the work of the kidney to transform them into uric acid for elimination, and uric acid itself, is, as we know, a product of imperfect oxidation reduction. For this reason the majority of authors forbid the nucleo-proteids in Bright's disease. The iron and the phosphorous which the author considers so necessary, we can get from another compound proteid—the pseudo-nucleins, as obtained from casein and vitellin. They differ from the true nucleins in not yielding the purine bases.

The author also says the animal kingdom is defective in nucleo-albumins, but we find them in the tissue of the thyroid gland, the brain, the kidneys, the lungs, the liver, and in the muscular tissue of the young animals, practically, all over, wherever we find nuclei. In fact that is the reason that the white meat, *i. e.*, meat which is rich in cells, containing nuclei, is considered lately harmful for patients suffering from kidney trouble. Another point I would like to mention is that it is the author's opinion that vegetable food, on account of its saccharine fermentation, may cause putrefactive processes in the alimentary canal, which is easily detected by the finding of indican in the urine.

Now, carbohydrate fermentation yields, mainly, lactic acid,  $\text{CO}_2$ , ethyl alcohol, and hydrogen, while indican is a product of proteid fermentation. Besides, it has been demonstrated by Hirschler that putrefaction is considerably suppressed by

carbohydrates, due to the lactic, butyric, acetic, and carbonic acids, caused by their fermentation. Therefore, a reasonable amount of vegetable food will prevent proteid putrefaction and can only be beneficial to the patient.

The conclusions the author draws from his study are: 1. To analyze thoroughly the results of treatment in Bright's disease one must have a clear conception of the histology and physiological functions of the kidneys.

2. Its complex pathology must be clearly understood.

3. All the ætiological factors must be given full consideration.

4. The ætiological factors are very numerous and complex in their action.

5. Only one, if any, of these can be reached by surgical interference:

6. Most ætiological factors can be modified or removed by well-directed rational dietetics and therapeutics.

7. Histologically speaking, Bright's disease can never be cured.

8. Physiologically speaking, the ætiological factors can be modified and often removed, the symptoms held in abeyance, while the renal glands perform their functions normally.

9. Bright's disease is by nature an oscillatory malady, accompanied by frequent remissions and exacerbations.

10. Remissions must not be mistaken for cures.

11. Rational dietetics and therapeutics offer the largest possibility for a physiological cure.

12. A well-regulated mixed diet, especially if composed largely of the animal class, when it can be tolerated, yields the best results.

13. All therapeutics, to be rational, must be directed not at the pathological lesion *per se*, but towards establishing a more perfect digestion and metabolism and a decrease in the work imposed upon the renal glands.

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## PSYCHIATRY.

EDITED BY MAURICE F. PILGRIM, M. D.

THE psycho-therapeutist may very reasonably object to the use of the word "Psychiatry," inasmuch as it carries with it at the very outset limitations which few practitioners of experience are willing to concede. The dictionaries define psychiatry as "the treatment of mental disorders," the word having been compounded from the two Greek words signifying "mind-healing." The definition is objectionable because it is not sufficiently comprehensive to state the claims of

psycho-therapy. It restricts psychic stimuli within narrow boundaries and does not accurately state its functions. Inasmuch as the word has by general acceptation come to have a meaning that very closely approximates the contention of the therapeutic psychologist, it has seemed wiser to retain it rather than to attempt to coin a new and more appropriate one.

In so far as there may be a mental element operating in diseased conditions of the human body, psychic treatment is not "treatment of mental disorders" as that statement is ordinarily understood. It is rather a treatment of the psychic or mental complication in diseased conditions of the body. There are few physical disorders in which this element is not present. It must be controlled before a cure of the bodily ailment can be expected. But it is obvious that, strictly considered, this is much more than "mind-healing."

Modern psychologists are divided into two classes with respect to the action of the psychic force that is operative in every human organism. The majority probably hold with James and Hudson that man is endowed with two minds or a plural consciousness—the objective mind, that controls the organism during its active and waking hours, and the subjective, which carries on the involuntary functions of respiration, circulation, etc., during sleep, when the objective mind is abeyant. The other, and perhaps smaller, class, hold that the involuntary functions are controlled and their attitude determined by certain arrangements of the *neurons*. Physical habit is explained by this theory. It must be conceded that there are many plausible arguments advanced to sustain and strengthen the contentions of the advocates of these opposite views. But for the purpose of the present consideration, it is not necessary to assume either hypothesis to be the true one. What most concerns the conscientious physician is the cure of his patient. Being sick and getting well consist of certain bodily states and changes in contrast with the common state called health. It is one of the cardinal doctrines of biology that the structure of every living being is passing through a continuous transformation during the whole term of its existence; that each particular change which befalls it, whether healthy or morbid, is part and parcel of one unified corporeal history. All diseases, therefore, may be said to

be phases of the cosmic process called evolution. The celebrated Dr. Bernheim evidently had this idea in mind when he asserted that "diseases are cured, when they are cured, by their natural biological evolution. Our ordinary therapeutical methods, of whatever character, are attempts to put the physical organism in such a condition that recovery may take place. If we suppress pain, rest an organ, induce sleep, stimulate secretions, etc., it is that Nature, the *vis medicatrix naturæ*, may the more easily and better accomplish its recuperative work?"

It is conceded that all living structure possesses the instinctive power of self-recovery or repair. It is some form of spontaneous energy which, acting through the proper neural channels, resists disease, arrests its progress, and endeavors to repair the damage done to the organism. This inherent tendency of the sick towards recovery is the *vis medicatrix naturæ*, which it is the design of all therapeutics of whatsoever character (whether we know it or not) to assist. But the *vis medicatrix* can be best assisted according to psychological belief, and with which many drug therapeutists agree, by the removal of obstacles from its channels of operations. Without going into the merits of the psychological controversy between the plural consciousness and neuron theories as held by the two schools, it may be said that the *vis medicatrix* acts through the nervous system of the patient. Indeed, it is believed by many pathologists that so long as the neural channels remain unimpeded, disease cannot find lodgment in the body. The psychiatrist goes still further and believes that disease cannot be cured without a surrender of the neural channels to the resident life within the organism,—the *vis medicatrix*,—no matter what the nature of the therapeutic agent that is employed may be.

We are thus led up to the part that the mind plays upon the nervous system. Inasmuch as everybody is cognizant of the power of the mind over the vaso-motor system to flush or blanch the cheek, depending upon the quality of the emotion, argument upon this phase of the question would be superfluous. But the mind's influence over the sympathetic and trophic systems is, perhaps, not so generally conceded. It has been demonstrated by psychologists to be true, nevertheless. If, then, the mind—the objective mind, according

to Hudson—is acting injuriously upon the patient's neural organism, its trend or polarity must be changed before we can expect a cure of the disease for which treatment is being given. It is precisely at this point that the power of psychic stimuli or suggestion comes powerfully to our assistance. The attitude of the objective mind must be displaced by the subjective mind (according to the Hudson theory) or the arrangements of the neurons (according to the neuron theory) must be changed, all to the end that the neural mechanism may be made readily receptive to the beneficent offices of the *vis medicatrix naturæ* which can effectively operate only under these conditions.

Present space permits only the most brief and general reference to the methods by which the important desideratum of changed mental polarity in diseased conditions is to be attained. They are as numerous as the ingenuity of the individual practitioner is fertile, *plus his natural psychical endowment*.

Nature has unquestionably discriminated in its bestowal of psychic equipment, but every individual possesses it in some degree. It is susceptible of greater development in every person. Certainly here, as elsewhere, the person with one talent is not justified in burying it simply because it is not a ten-fold endowment. Every patient cannot be expected to and does not respond to the same method. No one method admits of universal utilization. Each case becomes to the careful practitioner an individual study. The goal is only reached by bringing the patient into the psychologic state—a condition of passivity, which is, in other words, the surrender of all the neural conduits to the *vis medicatrix naturæ*. Although inherent within every organism, this resident supreme force becomes commandingly operative only under the conditions above indicated. In many cases this condition is reached automatically without conscious effort upon the part of either patient or practitioner. Another may require verbal suggestion; still another will require something of a corporeal nature that appeals to the visual sense; and another, again, may demand partial or entire abstraction of the objective self—a modification of what is now popularly known as hypnotism. It will be the aim of the editor of this department to furnish, from time to time, extracts from various publica-

tions, which shall illustrate the various methods employed, and something of the results accomplished by them in the treatment of physical disorders by the aid of psychic stimuli either singly or in connection with other agents.

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### **SOCIETY MEETING.**

#### **THE TWELFTH ANNUAL MEETING OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.**

*(Continued.)*

Dr. William James Morton of New York presented a brief verbal report for the Committee on Static Machines and Condensers.

**Report of Committee on Static Machines and Condensers.**—Dr. William James Morton of New York City presented this report. He said that he had been unable to do much work in this field, and trusted that another would be appointed in his place. One great obstacle to the work was the sharp rivalry between the various manufacturers of static machines and the difficulty experienced in determining what really was the best machine. The subject was, however, assuming a new and greater importance because of the prominent position taken by the static machine in connection with the X-ray. He believed that the future would bring forth a far better static machine than any yet known. He had been particularly interested in the machine recently described by Gaiffe of Paris, a machine adapted for the production of the X-ray. There was certainly a difference between the static machine required for ordinary therapeutic use and that for the production of the X-ray. The former was best represented by the Holtz type. The spark was continuous and was well borne by the patient. The spark from machines of the purely Wimshurst type was, on the contrary, very painful, although this machine was extremely valuable for X-ray work. The direction for the improvement in static machines seemed to be with regard to the regulation of speed. If the speed could be carried up to one thousand revolutions per minute instead of two or three hundred, then smaller wheels could be employed, and the bulk of the machine could be reduced without diminishing the output. This would be a great desideratum for the X-ray worker.

Dr. G. Betton Massey of Philadelphia spoke approvingly of this report, and called attention to the fact that manufacturers should remember that the humming noise associated with high speed was very objectionable, and that a strong effort should

be made to overcome it. He had not heard any of these high-speed machines that were not very objectionable in this respect. In reducing the bulk it should be remembered that a certain amount of space was necessary, in order to secure the proper insulation. He was reminded of a visit recently made to a distinguished dermatologist in Philadelphia. This gentleman had an antiquated machine, and when his attention was directed to it, he said that he did not use it, and did not have room enough for a large modern machine. The thought naturally suggested itself that, if he had room in his pocket for his patients' fees, he should find room for the necessary appliances.

Dr. William B. Snow of New York City said that the need for a two-purpose machine was so patent at the present time that it did not seem to him wise to direct the efforts of manufacturers towards producing machines capable of doing only one kind of work, thus making it necessary for many physicians to have two machines. If much emphasis were laid upon this point he felt sure the tendency would be to retard the progress of electrotherapy. If X-ray machines were too heavy for electrotherapeutic work, part of the plates should be thrown out of work for use in ordinary electrotherapy. He was of the opinion that there was but little objection to such a method, as shown by the X-ray work done with therapeutic static machines.

Dr. J. D. Gibson of Birmingham, Ala., was perfectly free to confess that there was a decided difference in the therapeutic effects produced by the two types of static machines in general use. Many patients were desirous of trying his new X-ray machine, but they rarely cared to do so a second time because of the painful spark of the Toepler-Holtz machine, which is far greater than that of the spark of the Holtz machine. The latter gives a more agreeable treatment, but he considers the former to be better for X-ray work.

Dr. William J. Morton, in closing the discussion, said that the first two critics had confined their remarks to a question of expediency—a matter which had not been taken into account at all in the report presented. If a given physician objected to buying two machines, he would buy a machine which would do both classes of work as well as possible. The object of the report was to give expression to a very general feeling existing to-day, *i. e.*, that a certain type of X-ray machine does much better work than another class. The fact remained that one kind of machine gives better therapeutic sparks than the other. He was reminded of the old king of Greece (except so far as the king was concerned) in his treatment of travelers through his kingdom; if they were too tall to fit the bed, he cut them off.

Dr. D. R. Brower of Chicago, for the Committee on Cata-phoresis, reported progress.

Dr. William B. Snow of New York read a paper, "The Action and Uses of the X-rays in Therapeutics." It was discussed by Dr. G. Betton Massey of Philadelphia, Dr. C. R. Dickson of Toronto, Dr. Robert Reyburn of Washington, D. C.; Dr. J. D. Gibson of Birmingham, Ala.; Dr. M. F. Wheatland of Newport; Dr. Francis B. Bishop of Washington, D. C.; Dr. R. J. Nunn of Savannah, Ga., and Dr. William J. Morton of New York City. Dr. Snow closed the discussion.

On motion, the association adjourned at 12.50 P. M.

A goodly part of the afternoon was very pleasantly spent in a ride through the mountains, the party visiting the old Catskill Mountain House and Twilight and Santa Cruz Parks.

The association reconvened at 5.45 P. M., at the call of the president.

Dr. Clarence Edward Skinner of New Haven, Conn., read a paper, "On the Treatment of Cancer by X-Rays."

On motion, the association adjourned at 6.30 P. M., to reconvene in the evening for a short session.

**Evening Session.**—The meeting was called to order by the president at 7.45 P. M., and the discussion on Dr. Skinner's paper was taken up. The paper was discussed by Dr. J. D. Gibson, Dr. Roberts of Lexington, Ky.; Dr. A. C. Geyser of New York City, Dr. William B. Snow of New York City, Dr. G. Betton Massey of Philadelphia, Dr. Robert Reyburn of Washington, D. C., and Dr. C. R. Dickson of Toronto; Dr. Skinner closing the discussion.

Dr. J. D. Gibson of Birmingham, Ala., read a paper, "The X-Rays in the Treatment of Cancer, with Report of Cases." It was discussed by Dr. Roberts, Lexington, Ky.; Dr. William B. Snow of New York City, Dr. Clarence E. Skinner of New Haven, Dr. D. Preston Pratt of Chicago, Dr. G. Betton Massey, and Dr. A. C. Geyser, and Dr. Gibson made some closing remarks.

On motion of Dr. Roberts of Lexington, Ky., the secretary was instructed to communicate with Dr. Scheppegrell of New Orleans, and if possible secure for publication in the Transactions his paper entitled "The X-Rays in Tuberculosis and Malignant Diseases of the Larynx."

On motion, the association adjourned for the day at 9 P. M.

The remainder of the evening was taken up with a concert and an entertainment by volunteer talent.

**Second Day, Wednesday, September 3, Morning Session.**—The meeting was called to order by the president in executive session at 10 A. M.

The president appointed as an auditing committee Drs. M. F. Pilgrim and W. B. Snow.

The application for membership of Dr. Russell H. Boggs

having been indorsed by the executive council, on motion the secretary was instructed to cast a ballot for his election. This was done, and Dr. R. H. Boggs was declared elected.

The following were elected to serve on the nominating committee: Dr. F. B. Bishop, Dr. C. R. Dickson, and Dr. G. Betton Massey.

The secretary announced that the following resolution had been offered by Mr. W. E. Goldsborough and accepted by the executive council:

*"Whereas, there is to be held in the City of St. Louis in 1904 an Exposition of the arts and sciences of the world as an expression of our advanced civilization; and*

*"Whereas, we understand that the provisions to be made for the exhibit of the progress of electricity will be adequate, and feel that electro-therapeutics are deserving of special recognition;*

*"Resolved, That the American Electro-Therapeutic Association heartily commends and supports the plans which have been inaugurated for containing an electro-therapeutic display commensurate with the dignity and importance of this branch of electricity."*

Dr. C. R. Dickson of Toronto moved that the association, as a whole, should adopt this resolution, and personally aid in carrying out the plans embodied therein. Seconded by Dr. Robert Newman and, after some discussion, unanimously adopted.

Dr. William B. Snow of New York moved that a special committee of three be appointed by the president to co-operate with Mr. Goldsborough. Seconded and carried.

Dr. William Benham Snow, Dr. William J. Morton, and Mr. W. E. Goldsborough were appointed as such committee.

The secretary announced that at the last annual meeting of the association Dr. W. H. White of Boston had given formal written notice of a proposed change in By-Law No. 57, by which the initiation fee of ten dollars would be changed to an entrance fee of five dollars.

Dr. Hickling of Washington, D. C., in order to bring up the matter for formal discussion and action, moved that this amendment be adopted. After discussion, the motion was lost by a unanimous vote.

Dr. W. B. Snow then moved that the proposed amendment removing the limit to membership be adopted. Seconded and carried.

On motion of Dr. Newman the executive session adjourned at 11 A. M., and the regular scientific programme was taken up.

Dr. C. R. Dickson of Toronto read a paper, "Epithelioma of the Tongue." It was discussed by Dr. G. Betton Massey, Dr.

D. P. Pratt, Dr. J. D. Gibson, Dr. W. B. Snow, Dr. F. B. Bishop; Dr. Dickson closing the discussion.

Dr. Dickson then read a paper, "Some Therapeutic Notes on the X-Rays." It was discussed by Dr. G. Betton Massey, Dr. J. D. Gibson, Dr. A. D. Rockwell, Dr. W. B. Snow, Dr. Willis P. Spring of Minneapolis, Dr. W. W. Eaton of Massachusetts, Dr. D. P. Pratt, Dr. C. E. Skinner, and Dr. R. J. Nunn. Dr. Dickson closed the discussion.

Dr. Lucy Hall-Brown of Brooklyn, N. Y., read a paper, "A New System for Producing a Slow Alternating Current of Large Amperage for Therapeutic Use, with Citation of Cases and Exhibition of the Apparatus."

Discussion by Dr. A. D. Rockwell, Dr. G. Betton Massey, Dr. Waite, Dr. D. P. Pratt.

On motion, adjourned at 1 P. M.

Afternoon Session.—The meeting was called to order by the president at 2.30 P. M.

Dr. A. D. Rockwell of New York City read a paper, "Current Differentiation Illustrated by a Case of Peripheral Neuritis Due to Parenchymatous Degeneration of the Cord."

The paper was discussed by Dr. D. R. Brower of Chicago, Dr. W. W. Eaton of Massachusetts, Dr. William Stevens of New York City, Dr. G. Betton Massey, Dr. Francis B. Bishop, Dr. J. D. Gibson, and Dr. D. P. Pratt. Dr. Rockwell closed the discussion.

Dr. T. D. Crothers of Hartford read a paper, "Some Therapeutic Indications from the Use of the Electric-Light Bath." It was discussed by Dr. C. E. Skinner of New Haven, Dr. G. Betton Massey, Dr. D. R. Brower, Dr. William B. Snow, Dr. Robert Newman, Dr. M. M. Johnson of Hartford, Dr. C. O. Files of Portland, Me.; Dr. J. D. Gibson, and Dr. Robert Reyburn, and Dr. Crothers closed the discussion.

Dr. Charles O. Files of Portland, Me., read a paper, "Some Obstacles to the Progress of Electro-Therapeutics."

Dr. G. Betton Massey remarked that, although this paper did not admit of discussion, he thought everyone present must feel like thanking Dr. Files for his excellent paper.

Dr. Robert Reyburn of Washington, D. C., exhibited a "Portable Electric Apparatus for Medical Use."

Dr. Robert Newman of New York City exhibited and described his Portable Galvanic Battery.

Discussion by Dr. Massey, with additional remarks by Drs. Reyburn and Newman.

Dr. M. F. Wheatland of Newport, R. I., read a paper, "The Diffusion of Iodine by the Electric Current." It was discussed by Dr. G. Betton Massey, Dr. R. Reyburn, Dr. D. P. Pratt, and Dr. R. Newman. Dr. Wheatland closed the discussion.

Dr. Francis B. Bishop of Washington, D. C., read a paper, "Arthritis Deformans." It was discussed by Dr. W. B. Snow,

Dr. D. R. Brower, Dr. C. E. Skinner, Dr. Willis P. Spring, Dr. George C. Goodell of Massachusetts, Dr. Robert Reyburn, and Dr. N. C. Nutting of New Hampshire; Dr. Bishop closing the discussion.

On motion, the association went into executive session at 6.10 P. M., and then adjourned this session until the next morning at 9 o'clock.

Third Day, Thursday, September 4.—The meeting was called to order by the president in adjourned executive session.

Dr. George E. Bill presented the report of the secretary.

On motion, this report was accepted and ordered placed on file.

Dr. R. J. Nunn presented the report of the treasurer.

On motion of Dr. R. Reyburn the report was accepted.

Dr. M. F. Pilgrim presented the report of the auditing committee. It showed that the cash on hand amounted to \$391.56 and that the accounts, including the report of the treasurer, were correct.

On motion, the report of the auditing committee was accepted.

On motion of Dr. G. Betton Massey, the association unanimously voted to the secretary an honorarium of fifty dollars.

Dr. C. R. Dickson presented the following report of the Nominating Committee: President, Dr. D. R. Brower of Chicago; first vice-president, Dr. Maurice F. Pilgrim of Boston, Mass.; second vice-president, Dr. C. Frank Osman of Boston, Mass.; treasurer, Dr. R. J. Nunn of Savannah, Ga.; secretary, Dr. Clarence E. Skinner of New Haven; executive council, Drs. F. H. Morse and Charles O. Files; place of meeting, Atlantic City, the date to be determined later by the executive council.

On motion of Dr. Dickson the report was adopted.

On motion of Dr. F. B. Bishop the secretary was instructed to cast the ballot of the association for the names presented in this report of the nominating committee. The ballot was cast, and the officers were declared elected.

On motion of Dr. Dickson the question of the time of holding the next annual meeting, as well as the hotel and other details, was referred to the executive council.

Dr. G. Betton Massey moved a vote of thanks for our noble and self-sacrificing member from New York, Dr. Robert Newman, who has done so much for this association at this and every previous meeting.

Dr. Francis B. Bishop, in seconding this motion, said that he personally knew the great value of the services rendered by Dr. Newman, and he knew that without such assistance it would be very difficult indeed for the president to properly arrange for the meeting.

The president said that he fully appreciated this fact, because

the amount of correspondence between Dr. Newman and himself he thought would make a carpet for his floor, and he had saved these pleasant letters as a souvenir of the occasion.

Dr. C. R. Dickson said that it would be hard to imagine anything more delightful than the trip on the Hudson River steamer, which had been planned as a last resort by Dr. Newman when his other cherished plans had failed.

The motion was carried unanimously by a rising vote.

Dr. Newman, in reply, said: Generally the person who works hard gets kicked; hence, it is an especial pleasure for me to receive this vote of thanks. I must add that I have been ably assisted by the president, who has sacrificed himself, and has come to New York City every time I have desired his co-operation.

I think, therefore, a vote of thanks should be tendered to our retiring president, and I now make that motion.

Seconded by Dr. Reyburn. The motion was put to vote by the secretary, and was carried unanimously.

The retiring president, Dr. Morse: You overwhelm me by this appreciation of the little work I have done. If we have had a successful meeting it is certainly due to the members and not to me, and if we have had an unusually social and pleasant time it is due to the fact that some of the members were instrumental in having the meeting held among the mountains, thus taking the members away from those midway attractions which so worried Dr. Newman last year. The older members are so earnest in their efforts to carry on the good work that I think we need not fear even the attractions of Atlantic City. The future of our association looks especially bright at this time, and far brighter than at any previous time. The pleasure of meeting Dr. Newman is worth a trip to New York, and hence I have not been especially self-sacrificing.

Dr. Francis B. Bishop moved a vote of thanks to Dr. William Stevens, of New York, the management of the Hotel Kaaterskill, and the ladies who had assisted in the entertainment provided for this meeting.

Dr. Newman, in seconding this motion, said that Dr. Stevens was the only one that had shown a disposition to actively assist in the arrangements. The motion was then carried unanimously.

Dr. William Stevens: I admit that I did considerable work, but I did just as Dr. Newman told me. I certainly feel better since this vote of thanks has been passed.

The report of the special committee to investigate the nomenclature of the currents used in medical practice having been sent by Mr. Jenks, who was unavoidably absent, on motion of Dr. Dickson, the report was received and adopted and ordered published in the Transactions, and the thanks of the

association were extended to the committee for its admirable and exhaustive report.

The secretary read a communication from Dr. Margaret A. Cleaves.

On motion, it was ordered placed on file.

On motion of Dr. Dickson the executive session was adjourned at 10.15 A. M., and the association went into scientific session.

Dr. Maurice F. Pilgrim of Boston read a paper, "The Relation of Psychic Suggestion to Electro-therapeutics." It was discussed by Dr. C. R. Dickson, Dr. C. O. Files, Dr. William Stevens, Dr. Robert Reyburn, Dr. G. Betton Massey, Dr. William B. Snow, Dr. A. C. Geyser, Dr. J. D. Gibson, Dr. Francis B. Bishop, Dr. Lucy Hall-Brown, Dr. M. M. Johnson, Dr. C. E. Skinner and Dr. George E. Bill, and the discussion was closed by Dr. Pilgrim.

On motion of Dr. C. R. Dickson the paper by Dr. Robert Reyburn on "Treatment by Strong Galvanic Currents" was ordered read by title.

The same action was taken with regard to the paper by Dr. R. J. Nunn, entitled "Personal Observation touching the Medical Value of the Roentgen Rays."

Dr. G. Betton Massey read a paper, "Illustrative Cases in the Cataphoric Treatment of Cancer." The paper was discussed by Dr. C. E. Skinner and Dr. George C. Goodell, Dr. Massey making some closing remarks.

The installation of officers being next in order, Dr. F. B. Bishop was appointed a committee of one to escort the president-elect, Dr. D. R. Brower, to the chair.

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## BOOK REVIEWS.

**HAND-BOOK OF MEDICAL AND ORTHOPEDIC GYMNASTICS.** By ANDUS WIDE, M. D., Lecturer in Medical Gymnastics and Orthopedic in the Royal Carolean Medico-Surgical Institute, and Director of the Gymnastic Orthopedic Institute, Stockholm. With a Frontispiece and 94 Illustrations in the Text. *Second Revised Edition.* 366 Pages. Published by Funk & Wagnalls, 30 Lafayette Place, New York.

The translation of Dr. Andus Wide's book on Medical and Orthopedic Gymnastics, and the publication of the same, is a move in the right direction, placing, as it does, in the hands of the American teachers of physical education and the medical profession a brief, clear, and well-illustrated exposition of the methods practiced and taught in the famous schools of medical gymnastics founded by the great Peter Ling, protected, supported, and controlled by the government of Sweden.

The exercises are well chosen to accomplish the effects

desired, and enough of them shown by illustration to make their use readily understood.

While the author seems to have thought necessary to find in gymnastics a universal cure-all, he frankly, honestly, and with a liberal mind passes judgment upon the results, leaving the student in possession of a safe and conservative ground to operate. The book should do much toward placing the value of gymnastics as a therapeutic agent before the profession, placing in the hands of the physician a useful handbook by which to direct the application of exercise by his assistants. A much safer guide than the many widely advertised quack (so-called) systems of physical exercise at present flooding the country. Hence this work is very opportune.—W. L. S.

DISEASES OF THE RECTUM AND ANUS. Designed for Students and Practitioners of Medicine. By SAMUEL GOODWIN GANT, M. D., LL. D., Professor of Rectal and Anal Surgery at the New York Post-graduate Medical School and Hospital; Formerly Professor of Gastro-intestinal Surgery at the University and Woman's Medical Colleges, Kansas City, Mo.; Attending Surgeon for Rectal and Anal Diseases to the New York Post-graduate Hospital, St. Mark's Hospital, Hebrew Sheltering Guardian Orphan Asylum; and New York Infant Asylum; Member of the American Proctologic Society, American Medical Association, Mississippi Valley Medical Association, and New York Post-graduate Hospital Alumni Association New York Academy of Medicine, County and Greater New York Medical Societies, and Honorary Member of the Missouri, Kansas, and Nebraska State Medical Associations, Kansas City Academy of Medicine, etc., Second Edition, Rewritten and Enlarged, with 37 Full-page Plates, 20 of which are in colors, and 212 Smaller Engravings and Half-tones. Pages, xxiv—687, Royal Octavo. Extra cloth, \$5.00 net; Sheep or Half Russia, \$6.00, net, Delivered. Philadelphia, Pa.: F. A. Davis Company, Publishers, 1914-16 Cherry Street.

The second edition of this valuable work contains features not contained in the preceding edition, several pages having been entirely rewritten, notably: Diseases, Injuries, and Tumors of the Coccyx; Venereal Diseases of the Ano-Rectal Region, and Recto-Colonic Enteroliths and Concretion; many new and original illustrations have also been added to the large number prepared for the first edition. There are few medical works that display a greater care in preparation and scientific consideration of the subject than this. The author deserves great credit for his attention to detail and the excellence of the plates, illustrating various conditions and methods. Perhaps no authority, at the present time, has done more to make clear the conditions and operative procedures upon the rectum and surrounding structures than Dr. Gant. The work cannot be too highly commended. The author's ingenuity in devising new operations and instruments for overcoming various conditions is deserving of a special comment. The publishers are to be complimented upon the excellent appearance of the work, both in point of workmanship and the character of the plates.

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## A CASE OF CANCER OF THE LARYNX CURED BY THE X-RAYS.\*

BY W. SCHEPPEGRELL, A. M., M. D., NEW ORLEANS, LA.

Ex-Vice President of the American Laryngological, Rhinological and Otological Association : Ex-President of the Western Ophthalmologic and Oto-Laryngologic Association, etc.

The efficacy of the X-rays in the treatment of malignant disease when located on the surface, so as to be directly influenced by the rays, has been so often attested that its benefit is no longer disputed. Such good results have been demonstrated by so many conservative sources that the X-rays are now recognized as a valuable remedial agent in the treatment of such cases.

When the malignant disease is located below the surface, however, the benefits of the X-rays are not only less marked, but many have even disputed their value in this connection. Undoubtedly, however, the treatment with the X-rays has not been without some benefit in such cases, as many physicians have observed the relief from pain following these applications even where no other effect could be observed. The actual improvement of such cases, however, has been of such rare occurrence, even after long and patient treatment, that the outlook thus far has not been considered encouraging. Under the circumstances, the report of the following case of a laryngeal cancer, which had already reached marked proportions, and which has been cured by the Röntgen rays alone, all other forms of treatment having been excluded, will not only be of interest, but will be a source of encouragement to others in this line of treatment.

\* Read at the annual meeting of the American Electro-Therapeutic Association, September 2-4, 1902.

On April 19, 1902, I was requested to go to the Hôtel Dieu of this city, to examine the throat of a patient who was too ill to come to my office. It appeared that the patient, who was a lawyer from the western part of the State, had been on his way to my office to consult me about his throat, when he was severely injured in a street accident, from which he had sustained such severe injuries about the head and body that at first his life was considered in danger. A few days later, however, having recovered from the immediate effects of the shock, I was requested to examine his throat.

The patient was a man of fifty-seven years, of robust build and, with the exception of the effects of his recent injuries, apparently in good health. The hereditary history was negative, and his general health had always been excellent. About six months ago, however, he had developed a hoarseness which was gradually becoming worse, and was beginning to interfere with the practice of his profession.

The examination of his throat showed the mouth and pharynx normal. The larynx, on the left side, was congested, and here I found the cause of the hoarseness, a tumor of the left wall and involving the left vocal cord. Another point of diagnostic importance was the left crico-arytenoid articulation, which was noticeably sluggish in its movements, and which had a corresponding effect on the left vocal cord.

The tumor of the larynx had the appearance of an irregular and undefined swelling and was of a dirty gray color. It projected slightly into the glottic space, but did not impede respiration. The paresis of the left vocal cord in connection with the tumor was quite marked in this case, an important feature which is considered by Lenox Browne as more important than a microscopic examination of a fragment in the diagnosis of malignant disease of this region.

The hoarseness of the patient had become more marked during the past month, and had during this time been accompanied with a slight cough and some expectoration of what appeared to be a slight excess of healthy mucus. The pain had been insignificant, and was not present during deglutition, but on pressure to the left side of the neck. There was no involvement of the lymphatic glands on either side.

The appearance of the growth in connection with the age of the patient left little doubt as to its malignant character. Tuberculosis was easily excluded, not only by the appearance of the larynx, but also by the absence of fever, the general good health of the patient, the negative results of a physical examination of the chest, and of the bacteriologic examination of the sputum. Syphilis was improbable, as the patient showed no other stigmata of the disease, and disclaimed any primary infection. In view, however, of the atypical forms in which luetic disease sometimes shows itself, the patient was afterwards given the benefit of the therapeutic test, but with negative results.

The patient was suffering so much from the effects of the injuries which he had received that it was deemed advisable for him to return home until he had fully recovered before the question of operative interference would be decided on. The character of the disease was frankly explained to him and to his attending physician, and the importance of an early treatment pointed out.

On June 9 the patient called at my office with his family physician; he explained that his delay in returning was due to the slowness with which he had recovered from the effects of his recent injuries. A laryngeal examination now showed a typical cancerous mass in the larynx, the tumor having grown to such proportions that normal respiration was already impeded after any unusual exertion. The expectoration had changed in character and was now a rosy muco-pus, difficult to expectorate and frequently tinged with blood. The characteristic odor of cancerous disease was now so marked that it was noticed by members of his family. The sluggishness of the crico-arytenoid articulation had advanced so much that there was almost immobility. The ulceration which had now set in, and which so rarely occurs in sarcoma, gave the typical picture of carcinoma of this region. The glands gave as yet no evidence of involvement, this, however, not being an unusual feature in malignant disease of the larynx when intrinsic in character, that is, when involving only the cavity of the larynx proper, in contradistinction to extrinsic laryngeal tumors which involve the epiglottis, the ary-epiglottic folds, or the arytenoids. The voice was reduced to a husky whisper.

The examination having been completed the aggravated character of the disease was fully explained to the patient. In regard to treatment the only hope of recovery that could be held out was a laryngotomy with complete excision, as far as possible, of the area involved by the malignant disease. The patient stated that he would consent to an operation only under the condition that a cure could be guaranteed, which, of course, was impossible.

We are all familiar with the tendency to recurrence in malignant disease, the prognosis in the larynx being even less favorable on account of its anatomic and physiologic importance, and the fact that the extent of the involvement cannot be accurately determined by the laryngeal mirror.

The intralaryngeal operation, except as a palliative measure, could not be recommended, especially as there is always danger of autoinfection from an operation of this kind. So much is this the case that many experienced operators will remove a fragment of the growth for histologic examination only with the understanding that if malignancy is determined the patient consents to an immediate radical operation.

After the patient had declined operative interference he desired to know if any less radical measure could not be used which might offer some hope of success. Having been impressed with the improvement which I had obtained in cases of laryngeal tuberculosis from the X-rays, it occurred to me that the patient might be benefited by this form of treatment. I explained to him frankly, however, that as yet the X-rays had been of benefit in malignant diseases only in such cases where the disease had been superficial, so as to be directly exposed to their influence, and that cases in which the disease was situated below the surface had as yet not given very encouraging results. The patient, nevertheless, decided to try the effects of the treatment.

A few days later the first exposure to the X-rays was made, a high-tension Tesla coil being used to generate the current. A tube with a medium vacuum was selected as most suitable for this case, as it required more penetration than the low tubes generally preferred for treating superficial disease, but less than the high tubes used for examination of the chest. The face and chest of the patient were protected

with specially prepared paraffin paper, no effort being made to limit the rays to the diseased area by means of leadfoil. The object of this was to utilize the effects of the treatment on the neighboring tissues and the lymphatic glands, in the event that these had been involved in the malignant process.

The patient was seated on a specially constructed chair, which allowed the head to be bent well back and thoroughly expose the neck to the X-rays, the object being to project the rays directly through the skin and cartilage into the diseased tissues. No effective means have as yet been discovered to reflect or concentrate the X-rays after leaving the tube, and the only hope of success lay in the transmission of the rays through the superficial tissues, which fortunately here offer but little resistance, and the rays are therefore but little absorbed.

During the first treatment the platinum reflector (anti-cathode) was placed at a distance of fifteen inches, this being afterwards reduced until it was brought to seven inches from the neck. The first exposure was made for ten minutes, and this continued every day for twenty treatments. The skin was carefully watched for dermatitis, but this did not develop at any time. The platinum reflector was brought to a dull-red heat and the vacuum maintained about the same from the beginning to the end of the treatments, and any tendency to a rise of the vacuum being carefully corrected.

At the end of the third week the case did not appear encouraging. In fact the congestion of the surrounding area appeared more marked, and the tumor showed no signs of diminution. The only feature which offered any encouragement up to this stage was the fact that the pain had disappeared after the second exposure and did not recur in spite of the appearance of greater congestion in the larynx. After the twentieth application the patient was sent home with instructions to report ten days later, it being understood that unless some marked benefit from the treatment could be demonstrated by that time no further effort would be made to continue the treatment by means of the X-rays.

On the sixth day I received a letter from the wife of the patient, stating that her husband appeared to be considerably worse; that he had fever, that the expectoration had been much greater, and was accompanied with clots of blood, and

the pain was more acute. She desired to know if her husband should call at the appointed time. I immediately replied that the patient should not return for treatment until he was considered sufficiently well by his family physician.

A few days later, however, I received a letter from the patient himself, stating that he believed that he had been benefited, that he felt well enough to come to New Orleans, and that he would be at my office at the appointed time. On July 24 the patient called in company with his family physician. I had been so discouraged by the report which I had received of his condition that I expected to advise his returning home at once.

When I examined his throat, however, the laryngoscope gave such a changed picture of his larynx that it was almost incredible. The whole mass, that had projected into the lumen of the larynx, had disappeared, including also a large portion of the left vocal cord which had been involved in the malignant process. All difficulty of respiration had disappeared and also the pain. The expectoration was still present, but had lost its purulent character, and was mucus, only occasionally streaked with blood. The temperature was again normal. The patient claimed that he felt decidedly better, which was easily borne out by his appearance. The excessive expectoration, the clots, and the fever had evidently been simply incident to the sloughing process of the tumor, which apparently had completely disappeared.

The treatment with the X-rays was at once recommenced and continued for ten days longer, at which time the ulceration in the larynx had completely healed. The patient was requested to return again from time to time, not only to watch for recurrence of the growth, but also for infection through the lymphatic circulation which might have taken place.

On August 29 the patient was seen for the last time, there having been no recurrence of the tumor or any change in the laryngeal cavity, it gives decided proof of the efficacy of this disease. Of course the possibility of a recurrence cannot yet be excluded, but the manner in which the disease was cured offers much encouragement that the result will be permanent. In surgical procedures we can never be certain, in spite of the most radical operation, that absorption has not

taken place into tissues not reached by the knife, and that recurrence may not originate from this source. In this case, however, the same agent which destroyed the vitality of the malignant growth and caused it to slough, must have been equally effective in all the surrounding tissues exposed to the rays, so that there is every probability of a permanent cure.

The case here reported I believe to be the first of a malignant disease of the larynx cured through the agency of the X-rays. It not only shows the efficacy of this remarkable agent, but is also strong presumptive proof of the bacterial character of malignant disease, as I believe that it is in this way that it effects its cures. Since the X-rays were so efficient in this case of cancer, when they had to pass not only through the skin but also the cartilaginous covering of the laryngeal cavity, it gives decided proof of the efficacy of the form of treatment, and offers hope that it may yet be a safe and effective method for the treatment of even more deep-seated disease.

ADDENDUM, October 25, 1902.—The patient was again examined in my office October 23, and was found to be in such excellent condition that no treatment was deemed necessary. The aphonia, due to the loss of tissue of the left vocal cord, has been partially overcome by compensation by the remaining cord. I had advised the patient to adopt a low chest-tone, which favored the adaptation of the vocal apparatus to its defective mechanism, but which the patient had at first found very difficult. By constant practice this had gradually improved, so that the voice has now recovered so far that the patient has resumed his practice of law.

## REPORT OF CASES OF CANCERS TREATED BY X-RAYS.\*

BY J. D. GIBSON, M. D., BIRMINGHAM, ALA.

I bring before you for discussion to-day a report on some cases of the various forms of cancer that I have treated by means of the X-ray.

As it is comparatively a new field I think it requires a most thorough investigation of all of the development in order that we may the better help the sorely afflicted with this terrible disease.

CASE I.—D. D. B., of Memphis, Tenn., white, age forty-six; occupation, insurance adjuster. A case of melanosarcoma. He first sought medical advice in May, 1901, for ulcer on the left side of the mouth, supposed to be caused by an old tooth, and was informed of the suspicious character of the ulcer. He was operated upon on the first day of September, 1901, by prominent surgeons of his city, and the growth removed. The wound healed kindly and all seemed well, until January, 1902, when the pains became very violent in the jaw and neck, and the growth began to reappear.

In the following February another operation for its removal was made by the same gentlemen, and in ten days it was back and almost as large as ever. April 1 he went to Chicago, where it was treated by paste applications for two weeks, and was then told to return home and poultice it for sixteen days, and then return to Chicago. He did so, and was promptly informed that he was beyond the reach of aid by this means, and he had better return home and make his preparations for death. All of the hospitals of Chicago refused him any hope, and so he returned home, only to meet the comforting assurance from his physicians that death was unavoidable and he should prepare for it at once.

He came under my care on the 16th day of May, 1902. He presented a wretched condition. Several hypodermic injections of morphine had been given him en route to my place to enable him to withstand the strain of the journey. He was very much emaciated and weak and had considerable

\* Read at the annual meeting of the American Electro-Therapeutic Association

fever and no appetite. He presented a large bulging mass on the left side of the neck, head, and face, pushing up the lower lobe of left ear extending in front and behind ear and down on the side of the neck and lower jaw, standing out to one half of the distance from the neck to the breadth of left shoulder. The summit of the tumor was broken down and ulcerating and measured 4 by 4 1-2 inches in the two diameters from which fungous melanotic tissue arose in a ring around the margins and in the center. There were crevices between these fungous masses through which a probe could be introduced without pain or inconvenience for two inches.

My diagnosis was a melano-sarcoma, and I found it had been so declared twice after microscopic examinations.

I commenced treating him daily with a medium tube placed at a distance of from four to six inches, excited by a twelve-plate static machine, of which the plates were thirty-three inches in diameter, and giving ten minutes' exposure. The improvement was all that could be expected; the melanotic mass crumbled and fell off in great chunks; in fact, it disappeared so rapidly that I feared that it would be burned, and began to make five-minute exposures until after July 6, when I found to my consternation that the growth was beginning to return, and instead of the roots continuing to disappear, I saw them beginning to grow rapidly. I then changed to a tube of higher vacuum, and made the exposures at a distance of from three to four inches for periods of fifteen minutes, and I soon brought the growth to a standstill. Retrogression set in the same as before, and I gave him forty-four daily treatments without intermission, when the opening measured but 3-4 by 1 1-4 inches in diameter.

Owing to humidity I have been using for the past month the Kinraide coil, and my patient was badly burned. I am now giving him all the treatment I can without burning too severely.

This patient I consider almost well, or on a very safe footing, as far as the original cancer is concerned; but as far as metastasis is concerned there is a great deal to fear. To the present time his life has been prolonged, and we have every assurance now that he will live for some time to come and may recover.

The reactions were very severe in his case. The fever ran high and at one time the collapse was dangerous, accompanied with excessive diarrhea and marked sepsis, which was relieved by making many openings for drainage around the tumor and lower part of neck and jaw.

CASE II.—Mrs. S., age thirty-six years, white, Jewess, married, six children, youngest two years old. I saw her first April 19, 1902, when she seemed well nourished and was very hopeful. She first noticed some trouble with her rectum in September, 1901. In October it was pronounced to be cancer by one of the most prominent surgeons of this city, and was operated upon by removing the rectum and rectovaginal septum for several inches. I found on examination the vagina and old rectal space filled with carcinomatous masses. The operation field was one solid carcinomatous mass, and new masses shaped like small potatoes were in the fornix of the vagina and pelvis. The vagina was opened by a bivalve speculum, and the ray turned on after protecting the surrounding parts with sheet lead. For a while the masses disappeared rapidly and the conquest seemed easy, but the cancers would come behind the speculum, while in front they would recede. The old rectal space was sore and painful, but the edges and wall were much softer, but were smeared with the feces which were constantly passing from the bowels.

I have great trouble to adjust any protection to keep from burning her, and have given her severe dermatitis at two different times.

To obviate the difficulty of the steel speculum protecting the cancer behind it from the rays, I have substituted a temporary affair of wood which is composed of two thin strips, and by means of which the vaginal wall is held open; the rays, penetrating the wood, reach and affect the cancer. By this means we are able to check the small cancers, and hope to finally effect a cure.

This case is a troublesome one, and though I hope to cure the carcinoma, the rectum and field of operation will always remain a great source of annoyance.

The original carcinomas are being checked, and by employment of the wooden speculum the small ones in the vaginal walls are also under control. The reaction in this

case never was very violent. The exposure so relieves the pain that the patient is always ready for her treatment.

CASE III.—Mrs. D, age forty-six. Inoperable epithelioma of uterus; was first seen May 18, 1902. She was emaciated, cachectic, and very weak. The cervix was entirely destroyed and the epithelioma was far advanced into the body of the uterus, the parametrium being considerably involved. She was referred to me by a prominent surgeon of Birmingham, he feeling that the only possible hope for her lay in the X-ray treatment. Her life has been prolonged, hemorrhage lessened, and at one time I had strong hopes of curing her; but from unpleasant domestic troubles with which she had to contend, coming out of it in most abject poverty, she was compelled to leave the city and return to her mother in an adjoining State, where death has been or will be unavoidable before long.

If this woman could have been kept and well cared for the result might, and I believe would, have been different, but without treatment she will die.

CASE IV.—Mr. D. W., occupation, editor; age, sixty-nine years; diagnosis, epithelioma over right temple, standing out about one-half inch above the skin and covered with darkish yellow secretion and detritus from previous treatment with Byers oil, etc.

The cancer measured one-half an inch by two inches in diameter. X-ray treatment was commenced May 12, 1902. The tube was placed at from eight to ten inches from the surface of the cancer and exposed for about ten minutes. Considerable reaction was present during several weeks of treatment. The cancer, as it were, melted down and disappeared, and it seemed for a time as if the excavation would go to the bone. Finally, however, it began to fill in with healthy granulation, and the patient returned home with rapid cicatrization in progress, August 18, 1902. On August 28 he returned for examination, when the healing was almost complete. He was dismissed from further treatment. I consider him to be cured.

CASE V.—Mr. B., age sixty-six years; diagnosis, recurrent epithelioma in the old cicatrices of the left alæ of the nose and another growth about the size of a hazelnut under the left eye over the malar process.

The original epithelioma had been removed three times by paste or caustics and had returned. He was exposed to the X-rays June 1, 1902; a slight primary reaction followed. The growth broke down and in a short time healed over very smoothly. He discontinued treatment July 1, declaring himself well, and he is to all appearances now cured, there having been no recurrence up to the present time.

CASE VI.—S. B., colored, age thirty-four years, stout and healthy, came to me March 1. On the external surface of the right forearm there was a very suspicious ulcer of long duration, which gave her great pain. I sent her to a microscopist, who could not give a positive diagnosis of epithelioma but thought it was one. I gave her five treatments, one or two per week, using a low vacuum tube, exposure five minutes, distance six inches. The reaction was severe after each séance; and being an ignorant colored woman, she would stand the cancer instead of submitting to the chills and malaise of the reaction. The ulcer, when last seen, was about one-third of its original size. In fact, I have seen no other cancer that has responded so promptly to treatment as this ulcer, nor none which gave so pronounced a chill in the reaction.

There are three other cases which I could add to this report, but it would be simply a repetition. They have not been under treatment long enough to show decided benefit, but all are doing as well as could be wished.

I am most positively convinced that many forms of malignant growth can be cured by patience and a proper exposure to the X-ray.

All X-rays are not capable of doing the same work any more than the winter or Arctic sun will furnish the heat necessary in the tropics. The sun is the same, but the effects of its radiation under varied conditions are quite different, and so with the rays; the individual peculiarity of different patients is an important factor, to say nothing of the different kinds of tumors, and their location and accessibility.

I believe, in the cure of any ordinary malignant growth or cancer, only two things are necessary for their cure, and they are the regulated quality and quantity of the X-ray, employing proper protection of the adjacent tissues.

The superficial cancer requires very different rays from the more remote uterine cancer; in fact, X-rays, from the

softest to the hardest tubes, should be used as the individual case requires.

For instance, in treating an epithelioma of the temporal or parietal region of the cranium, it will be found that very powerful X-rays from a hard tube, administered daily, would bring on such mental symptoms and discomfort as to cause you to desist, as it might produce permanent injury to the brain; while in a uterine or other internal cancer it would be the character of the X-ray preferred.

In conclusion I will repeat that I consider the Röntgen ray, when the proper penetrating radiance is employed at the correct distance, and proper frequency and length of exposure to be almost absolutely a specific for any malignant growth.

#### DISCUSSION.

Dr. Robinson of Lexington, Ky., thought there was only one way to use the X-ray, *i. e.*, with a high-vacuum tube. A very common error was to use the X-ray too often. He believed treatments given twice a week were generally sufficient. A tube should be used in all cases which will thoroughly penetrate the diseased tissue.

Dr. W. B. Snow said that in the case of carcinoma described in the paper the disease returned very rapidly on stopping the X-ray treatment. Since last April he had been treating a case of osteosarcoma of the superior maxilla which had been operated upon by Dr. W. T. Bull. The case was of unusual interest, as showing the persistency and extension of the sarcomatous growth, in spite of vigorous treatment. The original growth having been removed the disease immediately asserted itself elsewhere. The point receiving the most direct treatment would yield, and almost immediately an adjacent portion would become involved. He referred to this because it demonstrated that there was something more than a purely local trouble—in other words, there must be an element back of the local manifestation. He felt that in spite of the treatment metastasis was always apt to appear in some distant part.

Dr. C. E. Skinner said that the point made by Dr. Gibson, that rays of different penetrating power were necessary for tumors in different parts of the body, was of extreme importance. There were many superficial growths in which tubes of different vacuums would have to be used at different times. For instance, a growth would respond well for three or four weeks to a low vacuum, and then there would be no more progress until a high-vacuum tube was used. Another interesting fact brought out in the paper was that

mental symptoms might sometimes be produced when using the rays about the head. He had never seen this himself, although he had used the most powerful rays about the head. In connection with treatment of the head it had been asserted that cancer situated in close proximity to bony tissue, and where there was little adipose tissue, as about the vertex of the skull and maxillary prominences, did not respond so well as parts in which there was much adipose tissue, as, for example, in the mammary region. This had not been his own experience, but he would like to hear from others on this point.

Dr. H. Preston Pratt of Chicago said he had been deeply interested in the X-ray, and had been continuously studying it since 1896. He had studied the effects upon different patients, and had given nearly thirty thousand treatments. When beginning this work it had been his intention to systematically study the subject. In the experiments by Professor Röntgen and those by Phillip Lenard the effort was to discover whether or not the cathode stream passed outside of the tube, believing that the X-ray was the old cathode ray. Let us imagine an electrode being placed on one part of the body and another on the opposite side. Allow a current to pass. The result would be ionic changes. The human body is composed of fifteen elements, and these are associated with one another. They are held together by electrical force. When a current was applied to the body the same effect was produced as resulted from the action of one magnet upon another—in other words, metabolism was increased. A simple explanation of the X-ray action was to be found by supposing that it was similar to the action of the ordinary electric current. On the side of the body exposed to the X-ray one obtained an acid, and on the opposite side an alkali. In the X-ray thousands of lines of force are concentrated, and the greater the concentration the greater the decomposition and the greater the change in the tissues. By following out this reasoning we could understand what the X-ray had done and was doing. In his own work he was using a low tube on superficial cancer, a tube which would show only the outlines of the bones of the hands. By increasing the force of the machine he was able to penetrate the body. The object was to produce the greatest number of lines of force in the smallest space.

Dr. G. Betton Massey said that this discovery of an acid reaction on the near side and of an alkaline reaction on the opposite side, if confirmed by others, was of great importance, and a more detailed description of it should be given. A certain physicist had said that the action of the X-ray on the human body seemed to him akin to the response given by a sounding board to a given note. Wave action, set up by the X-ray, intensified vital processes, quickened physiologi-

cal resistance, and hastened the death of low organized tissue. This seemed to be similar to the theory briefly described by the last speaker.

Dr. Pratt said that he would go into this subject more fully at a meeting of the Röntgen Society to be held next December. There was absolute proof that the action of the X-ray on the body was due to changes in the ions produced by electrical force.

Dr. Robinson asked how the body could be penetrated by a low tube.

Dr. Pratt replied that it could not be done successfully with the static machine. He made use of low-vacuum tubes and arranged the coil so that he was using at a minimum 1 to 1.5 amperes. By taking out resistance he could, therefore, crowd the current. All the physicians in Chicago who had had much experience with X-ray work were now using low-vacuum tubes because experience had taught them the necessity for this. At first they had used the high tubes, but had not considered that there were streamers from these tubes which produced disappointing results. At first, he had himself used the high-vacuum tube, but he now obtained far better results from the low-vacuum tube; but this tube must be crowded. The static breeze should not be used on the cancer cases. Why? If the finger were infected, for example, would one squeeze it and spread the infection? No. Then, why use the static breeze?

Dr. William Stevens asked how a physician, in general practice, could be taught to make a correct diagnosis of the cases of malignant disease which should be sent for electrical treatment.

Dr. A. C. Geyser said that he wished to challenge the statement made by Dr. Pratt. Two years ago he had brought out the fact that the static breeze should be used only where there was an exposed surface. At that time he had cited cases, and had since exhibited them at a medical society meeting, showing that this was the only and proper method. The cases had absolutely refused to heal until the spray had been used. Dr. Snow and others in the school would bear out this statement.

Dr. Gibson closed the discussion. He said that he did not believe any two cases could be treated exactly alike by the X-ray. He believed he had saved his cases from metastasis by the treatment. He believed in skin cancers the soft ray would frequently do the most good. When the ray would penetrate the body well he called such a ray at least one of medium hardness. As soon as a physician met with an ulcer or other suspicious condition which would not readily heal he should have a microscopical examination made, and if the diagnosis pointed to malignancy the X-ray treatment should be resorted to.

## X-RAYS FOR THE TREATMENT OF CANCER AND LUPUS.

**A. R. RAINEAR, A. M., M. D., PHILADELPHIA,**

Formerly Demonstrator of Experimental Therapeutics and Electro-Therapeutics in Jefferson Medical College and Hospital.

An argumentative plea has been made for the use of the X-ray in cancer and lupus, and, in fact, all malignant tumors where formerly the knife was the only instrument resorted to for their removal. There are some few cases where even an operation is not permissible; and here certainly the X-ray could be used to prove its therapy. There are some cases that I have treated subsequent to a surgical operation, the surgeon requesting my assistance as a prophylactic measure, the rays acting as a destroyer of some possibly remaining glands.

All the diseases treated with the X-ray by others as well as myself prove conclusively that there is a degeneration or destruction of malignant material, whether superficial or below the surface. When below the dermis, the neoplastic cells are destroyed and eliminated, while the healthy skin remains in its normal condition. When the malignancy is located in the dermis or epidermis, destruction will occur at that part only with a resultant healthy scar.

It is a general fact, then, that a malignant neoplastic growth or a growth of low type or vitality is specially susceptible to death and destruction when properly subjected to the Röntgen rays.

One very important advantage, even favorable to operable or inoperable cases, occurs in X-ray therapy, which is that patients are ever on the alert to be relieved of their cancer or lupus by a painless and bloodless method, and therefore apply early for treatment, not resorting to continual postponements dreading a surgical operation. Hence it is that the X-ray therapist is consulted as soon as there is the slightest evidence of a diseased tumor. When the afflicted learn of this mode of treatment, as stated before, they consult their medical attendant, and then the surgeon or X-ray therapist has a better prognosis to offer than in those cases that are

subacute or usually chronic. From this general knowledge alone then, the percentage of cures from all malignant diseases will be greatly increased, whether treated by X-rays or surgical operations.

Various theories have been advanced as to the exact nature or action of the rays on diseased tissue; but I think that we are unable to explain at the present time the peculiar means, whether chemical or electrical or both, that these powerful rays exhibit. We do know that there is a degeneration and breaking down of the cells and malignant structures, and a removal of this destroyed mass by absorption and final elimination. That the Röntgen ray's action is inhibitory on all malignant growths is beyond a doubt, some experimenters asserting the radical destruction of all forms of sarcoma. I am unprepared to substantiate the latter, my experience with sarcomas and deep-seated abdominal tumors being limited.

The general effect of an improper exposure to the X-rays is the production of a dermatitis, and possibly a diffused inflammatory condition. The X-ray outfit is a powerful yet simple armamentarium, but in improper or unskilled hands the results would be disastrous and react against this wonderful means of therapy and diagnosis. No one but a thorough electro-therapist and physicist should use this means of therapeutical application, and thus avoid serious complications and bad results.

These unfavorable terminations may be caused by lack of proper dosage, which knowledge can only be acquired by a continuous experience in the effects produced by the rays, the therapist being accustomed to the different appearances of the skin, and knowing just when the so-called tanning is commencing. This latter condition can be made known by the slightly bronzed appearance of the integument, which the experienced eye can decide, and govern the dosage. The dose being an uncertain quantity, the eye must aid the operator in order to prevent a troublesome burn or a possible gangrene.

I have used precautionary measures in all my cases, and thus far have not been annoyed with any burns or ill effects. Perhaps the least care that could be used would be with recurrent carcinoma of the breast, or a large epithelioma

of the face in which the skin had ulcerated and exposed the underlying diseased structures. In such cases the rays would penetrate the malignant cells directly, without having to pass through any other tissues—and cause their destruction. This would be followed by a mass of healthy granulations, and a prompt covering of healthy skin.

To expose the action of the X-ray directly upon the diseased structure there should be some protection at least afforded to the contiguous structures. For this purpose I have been using a flexible rubber cloth lined with flannel, and covered externally with two or three layers of thin tin or lead foil. This X-ray screen can be adapted to the parts to be protected; with the proper opening made the rays will then directly penetrate the diseased mass.

Having selected the proper tube, it should be placed at a distance of from eight to ten inches, and at such an angle as to allow the rays to impinge directly on the malignant growth. The exposures should vary from five to twenty minutes, and be repeated every third or fourth day. Too strong an inductive influence should not be used, as the resulting changes produced might be in excess of the power of elimination, the absorbents being unequal to too heavy a pressure. If at any time there is a resultant dermatitis, the exposures must be discontinued, and when again resuming treatment, the length of time of exposures and the intensity of the rays must be reduced.

The following facts we know are responsible for X-ray burns: 1. Too long exposure. 2. Intensity of current used in the tube. 3. The quality of the tube, whether hard or soft. 4. Proximity of tube to the flesh. 5. Local and constitutional conditions of the patient.

Let me now enumerate some of the distinct advantages that the Röntgen ray has over all other plans of treatment in malignant growths. 1. The X-rays have a specific action on structures that are malignant and of low vitality. 2. The X-ray exposures are painless. 3. They leave exceedingly small scars. 4. Can be used in cases where surgery would fail for the lack of tissue for future repair, causing bad disfigurement. 5. The percentage of permanent cures is equal to, if not greater than, where surgical methods were used. 6. There is no loss of blood to cause weakness and exhaus-

tion. 7. The avoidance of an anæsthetic, with its attendant annoyances and dangers. The majority of patients will invariably prefer the X-ray treatment to a surgical operation.

The apparatus and technique for radiotherapy which I prefer would be as follows: The choice of instrument for excitation of the tube is a static machine of medium size, having from twelve to sixteen plates, varying from twenty-eight to thirty-two inches in diameter, the speed ranging from three hundred to five hundred revolutions. A hard tube is the best for deep-seated cases, and a medium vacuum or low tube better adapted to superficial diseases such as epithelioma, lupus, and rodent ulcer.

The reports that follow are taken from my case book, and will show by their history, treatment, and results what has been done.

Lupus.—Mr. H. G., age thirty-four; resident of Philadelphia all his life. Family history good. He states "that small sore appeared on arm about four years ago, without any apparent cause. Has been treated with all kinds of drugs externally and internally." When I saw the patient it was about the size of a silver dollar, and had eroded the parts to a depth of one-eighth to one-fourth of an inch. I then began treating the parts with electro-cautery, and continued this with the aid of drugs for about eighteen months, having had no experience or even an X-ray tube. At the expiration of about twenty months, I think, the case was somewhat worse than when treatment was commenced. My X-ray experience was first initiated on this patient. Being quite cautious, no complications interfered. There were thirty-three exposures made of twelve to fifteen minutes' duration, with a medium-hard tube. The structures then broke down, became disintegrated, and in two weeks' time began to assume a healthy condition. Improvement continued, with a final and permanent cure.

Mrs. R., age forty-nine, sent to me from a neighboring town by her family physician with a diagnosis of lupus. This was confirmed by two surgeons of prominence in the city. The disease was located below the left orbit, involving most of the cheek. It began as a small pimple, which gradually and very slowly enlarged for twelve years. Ointments and powders; electric-cautery, and peroxide of hydrogen were

given trials of treatment. This case seemed to be more intractable than the others, requiring sixty-two exposures, ten minutes' duration, three times weekly. A soft tube was used during the first five weeks, followed by a medium-hard tube. Both of these patients were pronounced cured over one year ago; and there has been no return of the disease at this date.

Cancer.—J. F., age sixty-one, referred to me from a hospital in this city with a report from the pathologist that the tumor was an epithelioma. It was situated on the left half of the lower lip; about the size of a walnut. Discharged freely a fetid pus, and was very painful; more so when eating or talking. Removal with the knife was suggested by the attending surgeons at the hospital, but the patient refused. Twenty-two exposures were made, covering about nine weeks. Pain ceased after the third treatment. Hypnotics were discontinued, the patient being able to secure natural rest and sleep. The last exposure was made on December 12, 1901. A slight scar remains. Have had frequent visits from him since then, but there is no evidence of a return of the trouble.

Mrs. M., residing in New Jersey, age fifty-four. This lady was sent to me by her physician, who stated in his letter that she had a carcinoma of the left breast, which had been growing for fifteen years. He states that "this breast was operated upon by a Philadelphia surgeon about three years ago. Eleven months after the operation the parts began to pain her and slough, with a bloody fetid odor. Axillary involvement was quite marked with general emaciation and marked anaemia, and a cancerous cachexia. With this case I used a hard tube only, giving an exposure from fifteen to twenty minutes, three to four times weekly. At the end of seven weeks the new tissues began to form, and an uninterrupted healing of the parts continued. Some cicatricial tissue remains as an evidence of some destroyed skin. She has gained in flesh and is in normal health. No evidence of any return of the disease since the last treatment in May, 1901.

Mrs. E., age forty-one. Tumor in left breast, which she says, "was first removed by her physician while living in Washington, D. C." in January, 1900. Four months later small nodules appeared close to the scar. These finally

coalesced, forming one irregular mass. In July, 1900, I saw the patient, and although no microscopical examination was made, yet I felt assured that malignancy was present, and so informed her. No treatment was commenced, however, until September of the same year. Pain now was a very prominent symptom, extending up into the axilla, and quite severe along the line of the cicatrix. At the lower outer end of the scar was a small opening, from which a small amount of semi-caseous pus exuded upon slight pressure. Whenever this pressure was made the pain was unbearable, and the patient fainted several times during this manipulation. The rays from a hard tube were applied to the axilla and side of the chest, and over the entire left thoracic region. Four months' treatment, with exposures lasting from fifteen to twenty minutes, and three to four times a week, was the treatment here adopted. At the end of ten days the pain was absent. The soreness on pressure was abolished in sixteen days.

This patient called to see me during June, 1902, and was looking healthy and vigorous, weighing 165 pounds. There were no enlargements of any kind present, the skin and all organs seemed to be in a healthy condition.

From seventeen cases of malignant disease from which the above reports are taken, I have but two to report negatively, one being an excessively large tumor involving both mammary glands and axillæ. This patient I treated with six exposures, but did not feel justified in continuing, and advised a surgical operation.

The other patient had an epithelioma on the lip. During treatment a slight dermatitis was produced, and he became alarmed and ceased treatment. He returned again later on when the growth was very much enlarged and had spread considerably. After twelve exposures he again left and, I understand, had the mass removed at a surgical clinic.

As to recurrences in all these cases time alone can only show which may develop. Certainly the fact remains that the Röntgen rays are destroyers of malignant growths, and that this comparatively new branch of therapy is a permanent one, appealing to the surgeon as one of his best adjuncts as a surgical synergist, apart from their function as a means of diagnosis.

## A HISTORICAL SKETCH OF THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

BY ROBERT NEWMAN, M. D.,

President of the Faculty and Professor of Electrotherapy in Genito-urinary Diseases in the New York School of Physical Therapeutics; Chairman Executive Council and Ex-President of the American Electro-Therapeutic Association. Member American Medical Association; New York State and County Medical Associations; New York Pathological Society, etc.

The American Electro-Therapeutic Association has held its twelfth annual meeting at the Hotel Kaaterskill, and can be proud of its success in the progress of medical matters relating to electro-therapeutics, as well as its social pleasures and invigorating excursions in the pure mountain air.

The object of this Association, according to its constitution, is the cultivation and promotion of knowledge in whatever relates to the application of electricity in medicine and surgery.

The active members of this association belong to the regular profession and must be in good standing in every respect to be recommended to the association, and can be only elected by a very large majority. Their honorary members are among the most distinguished individuals in the civilized world. The number of members has reached nearly its limits, according to the constitution, and doubtless will be filled up before another annual meeting occurs. That annual meeting—the thirteenth—will take place in Atlantic City during the month of September, 1903.

Of the foundation fellows, who organized the Association, and have remained during these twelve years, only a few are left. We recollect Drs. G. Betton Massey, Wm. J. Morton, A. D. Rockwell, Robert Newman, Margaret A. Cleaves, A. L. Sherman. In addition present at the first annual meeting in Philadelphia were Drs. R. J. Nunn and J. H. Kellogg.

During 1890 a number of regular physicians interested in the progress of electro-therapeutics became impressed with the need of a national association of physicians, at the meetings of which the subjects could be discussed in a scientific and practical manner, without the controversial digressions that marred the reception of electrical papers in other medical

societies. Drs. Goelet, Hayd, Bigelow, Massey, Newman, Hutchinson, Morton, and others urged the immediate formation of an association. A meeting was arranged at the Academy of Medicine, New York, on the 22d of January, 1891, for the purpose of organizing the association. The meeting was held accordingly and the American Electro-Therapeutic Association organized, Constitution and By-Laws considered, and the following officers elected for the year 1891:

President, G. Betton Massey, M. D., Philadelphia; vice presidents, Wm. J. Morton, M. D., New York; A. H. Goelet, M. D., New York; secretary, Wm. H. Walling, M. D., Philadelphia; treasurer, Geo. H. Rohé, M. D., Baltimore; executive council, Horatio R. Bigelow, M. D., Philadelphia; Franklin H. Martin, M. D., Chicago; Wm. F. Hutchinson, M. D., Providence, R. I.; and Frederick Peterson, M. D., New York.

Regular annual meetings were held as follows:

The first annual meeting was held at Philadelphia on September 24, 25, 26, 1891, President Dr. G. Betton Massey, with forty-four active fellows on the list, of which number almost all were present. The session was one of extreme interest, as well as of practical value, and thirty-three papers were read and ably discussed. All papers were published in full in the *Journal of the American Medical Association*, beginning on November 28, 1891. An abstract of the proceedings also appeared in the *Medical News of Philadelphia*, October 17, 24, 31, and November, 1891.

The second annual meeting was held at New York, in the Academy of Medicine, on October 4, 5, 6, 1892. President, Dr. Wm. J. Morton, New York; vice presidents, Dr. A. H. Goelet, New York; Dr. Wm. F. Hutchinson, Providence, R. I.; treasurer, Dr. R. J. Nunn, Savannah, Ga., who has been in this capacity continually to date, 1903; secretary, Dr. H. R. Bigelow, Philadelphia, who has been abroad for several years, and continued in the association as a life-member; executive council, Dr. G. Betton Massey, Philadelphia; Dr. Robert Newman, New York; Dr. A. D. Rockwell, New York; Dr. H. D. Hayd, Buffalo; Dr. W. H. Walling, Philadelphia.

At this meeting standing committees on specials in elec-

tricity were appointed. Thirty new members were elected. Thirty-one papers were read, and manufacturers had an excellent exhibition of electric batteries and instruments. Social matters and receptions added to the general spirit of the assemblage.

The third annual meeting took place at Chicago on September 12, 13, 14, 1893. President, Dr. A. H. Goelet, New York, at Apollo Hall. Thirty-four papers were read, several discussions were made by different members. The visits to the Columbian Exhibition, where electric exhibitions were given for the special benefit of the association, were very interesting. Other pleasures were freely given, and extra lectures were held at the Post-Graduate College and Dispensary by members of the association.

The fourth annual meeting was held in New York on September 25, 26, 27, 1894, at the Academy of Medicine. President, Dr. W. J. Herdman, Ann Arbor, Mich. Thirty-three papers were read, and several discussions were arranged and ordered by the president. Receptions were given, and displays of electricity on a grand scale made at the respective laboratories of Nicola Tesla and T. Edison, which were much enjoyed by the members.

The fifth annual meeting was held in Toronto, Canada, on September 3, 4, 5, 1895. President, Dr. A. Lapthorn Smith, Montreal, Canada. Only twenty-six papers were read, but Dr. Dickson had arranged so many amusements that the assemblage had hardly time even for these, and were splendidly entertained. Some of our members learned the workings of the Canada Custom House without any solicitation on their part.

The sixth annual meeting was held in Allston Hall, Boston, on September 29, 30, and October 1, 1896. President, Dr. Robert Newman, New York. Twenty-seven papers were read, and two lengthy discussions by different members were prearranged. Two extra lectures were given, visits made to institutions and buildings, and the association was particularly indebted to Professor Elihu Thomson, who gave a grand display at his establishment in Lynn. For an evening reception and musicale the association was under obligation particularly to Drs. Morse and White. The lectures of

Professor Wm. L. Puffer and A. E. Dolbear were also of great value and interest.

All the papers read during these six years were published in full in the Journal of the American Medical Association, which also printed each year the proceedings in an extra volume. The charges were fixed at only the actual cost, for which the association is still thankful to the late Dr. Hamilton, formerly the surgeon general of the Marine Hospital Service.

The seventh annual meeting took place at the Academy of Medicine of Harrisburg, Pa., on September 21, 22, 23, 1897. President, Dr. W. T. Bishop, Harrisburg. Thirty papers were read, and the members of the Harrisburg Academy of Medicine, who were excellent hosts, attended the meeting in a body.

The eighth annual meeting was held in Buffalo at the rooms of the Society of Natural Science on September 13, 14, 15, 1898. President, Dr. Chas. R. Dickson, Toronto, Canada. Forty papers were read. Receptions were given, excursions made, Niagara Falls admired, tally-ho rides enjoyed, and all left with admiration for and thanks to the chairman of the committee of arrangements, Dr. Ernest Wende, because of the energy he had exhibited and the fine arrangements he had made to entertain his guests.

The ninth annual meeting was enjoyed at the old Willard Hotel at the Capitol in Washington, D. C., on September 19, 20, 21, 1899. President, Dr. Francis B. Bishop, Washington, D. C. Thirty-seven papers were read, and excursions made on a large scale under the leadership of our member, Dr. Hickling.

The tenth annual meeting was celebrated again at the Academy of Medicine in New York, on September 25, 26, 27, 1900. President, Dr. Walter H. White, Boston, Mass. Forty papers were announced and delivered. Visits were made to electric plants, power houses, telephone stations, to St. Luke's Hospital, Columbia College, Grant's Tomb, rides in Central Park enjoyed, and an evening reception held.

For the eleventh annual meeting the association returned to Buffalo, meeting at the new Seventy-fourth Regiment Armory on September 24, 25, 26, 1901. President, Dr. Ernest Wende, Buffalo. Thirty-two papers were on the programme,

but part of the time the association met at the Pan-American Exposition, where the great attraction was the electric illumination. An excursion to Niagara Falls was of course a feature of the programme.

An important step in the history of the Association was the contract with Messrs. A. L. Chatterton & Co., publishers, by reason of which they were to publish exclusively in the *JOURNAL OF ADVANCED THERAPEUTICS* all the papers read at the meetings and the proceedings of the meetings. The able editor of this *JOURNAL*, Dr. William Benham Snow, is a member of the association.

The last and twelfth annual meeting was held at the Hotel Kaaterskill in the Catskill Mountains on September 2, 3, 4, 1902. President, Dr. Fred H. Morse, Melrose, Mass. Members and their families and guests turned out to the number of 150, and had a very social and enjoyable time. An excellent programme was prepared, of thirty-two papers, of which eight were treatises upon the use of the X-ray in the treatment of tumors and cancer. Social diversions, a banquet, concerts, hop, and an excursion were pleasantly interwoven with the scientific sessions.

The next meeting will be held at Atlantic City in September, 1903. At this early date many applications have been made for membership, and papers of much value are announced, which deal with the use of electricity as a therapeutic agent.

The officers of the association are:

President, Dr. D. R. Brower of Chicago; vice presidents, Dr. Maurice F. Pilgrim of Boston; Dr. C. Frank Osman of Boston; treasurer, Dr. R. J. Nunn of Savannah, Ga.; secretary, Dr. Clarence E. Skinner of New Haven, Conn.; executive council, Dr. Robert Newman of New York, chairman; Dr. Ernest Wende of Buffalo; Dr. T. B. Bishop of Washington, D. C.; Dr. W. H. White of Boston; Dr. Fred H. Morse of Melrose, Mass.; Dr. Chas. O. Files of Portland, Me.

## SOME FACTS ON ELECTRICITY AS A THERAPEUTIC AGENT.

BY F. B. BISHOP, M. D., WASHINGTON, D. C.

The therapeutic application of electricity is similar, if not identical, to the therapeutic application of other agents. For the sake of some comparisons we will take mercury. From it we have blue mass, calomel, corrosive sublimate, blue ointment, and other combinations of the same drug, varying somewhat in their degree of action according to the combination used and the susceptibility of the patient. On the other hand, we have the direct, the alternating, the slowly and rapidly interrupted, induced, the sinusoidal, the static, together with the high-frequency, high-tension currents. All electricity, but varying in their physical, physiologic, and therapeutic action, according to the combination used and to the susceptibility of the patient. The combination of the different preparations of mercury is familiar to all of you, but perhaps the expression as applied to electricity will bear some explanation. The working power of electricity consists of a combination of volts, amperes, ohms, time, and when we hear the expression volts, amperes, etc., it means work accomplished. The unit quantity of electricity is called the coulomb, while the ampere is the unit rate of flow. The volt is the unit of pressure. An electric current carrying one coulomb per second is called a current of one ampere. And a volume of one ampere of current under an E. M. F. of one volt will pass through a resistance of one ohm. Roughly stated, the ohm is the resistance offered by two miles of ordinary copper trolley wire. Again, when a pressure of one volt causes a current of one ampere to pass through a circuit, work is done at the rate of one watt—or 1-746 of a horsepower. This rule holds with all electric currents, whether of high or low pressure, large or small amperage, alternating, direct, or interrupted currents.

With the direct current we have large volume or great amperage and low voltage. The chemic action of this current is very great; while the current from the modern static ma-

\* Read before Medical and Surgical Society of the D. C., Thursday evening, November 6.

chine is one of exceedingly small amperage and great voltage—frequently running up into the millions; indeed, the pressure is so great that it is impossible to completely isolate the static current. Between these two extremes comes the induced or faradic current, of moderately high voltage and low amperage.

Thus we can see in prescribing medicine for a patient we must first make our diagnosis and consider the individual peculiarity of the patient, that we may suit the treatment to the case in hand. So in administering electricity we must endeavor to select that current and the modification of that current which, according to our judgment and experience, is best suited to each case. Especially is this so when we consider that with electricity we seek to modify or cure disease by acting directly upon the part affected, or upon the nerves or nerve centers controlling it, and through these upon the blood-vessels or sometimes upon the vessels themselves.

We should remember that it is not the amount of current generated by our apparatus that we must look to, but to the amount actually passing in circuit through the patient at the proper place and in the right direction, and for a length of time sufficient to produce the desired effects. Blood pressure may be relieved, in many cases, and a bounding heart quieted by a moderately strong continuous current, graduated according to the susceptibility of patient. Conversely, the heart may be often stimulated when weak and flabby, and be toned and strengthened by a very mild continuous current, applied over the superior, middle, and inferior cervical ganglia. But as in medicine it must be remembered that what is a weak current for one individual may be strong for another. Some people are especially susceptible to the influence of the galvanic current, so that three or four milliamperes are about all that can be used in the region of the cervical sympathetic ganglia. If we are unable to produce the desired effect with this small amount of current in these patients we are not justified in running our current higher, but must then use it for a longer time, until the amount of work is done.

In giving strong and powerful medicines it is customary to give them highly diluted, that the stomach may be protected and also that absorption may be more certain. So,

also, in consequence of the well-known law of conduction and resistance, in order to protect the sensitive skin, which is a very poor conductor, if we wish to give a strong galvanic current we dilute our current, as it were, by increasing the area of our contact electrodes, because "the resistance of a conductor is directly proportional to its length, and inversely proportional to the area of its cross-section." We thereby reduce the irritation to the skin. The electrodes must be well moistened and in perfect contact for all currents of low and medium voltage. The same law of conduction and resistance holds good with the static current; the large, heavy spark is less painful than the light, thin spark, and in giving the Morton wave current the more surface covered by the contact electrode the less the effect is felt by the patient. These large surface electrodes are very necessary when employing the constant (galvanic) current if we wish to influence deep structures, such as the spinal cord, spinal nerves, the sciatic nerve, as well as surface nerves when the nerves or sheaths are congested or inflamed. After an experience of many years with electricity, my impression is that it should be very rarely used merely as a stimulant. This rule applies especially to the treatment of paralyzed muscles. Ordinarily the stimulating effect of electricity is followed by very little reaction, yet we should be very careful not to overstimulate and tire out muscles already weak from having been deprived of their normal supply of nervous energy. Our object should be rather to tone by carefully applied mild currents, gradually increasing the strength as the tone returns. In this way we will do much good, and at the same time avoid doing harm.

We must not forget that electricity, while flowing, is always doing work. It is our business, therefore, to see that it is working for good, and not for evil. It is not the object of this paper to demonstrate how any individual disease should be treated, but to show that as electricity is a very powerful therapeutic agent and susceptible of doing a great deal of good it must also be used with intelligence and discrimination if the greatest good is to be accomplished.

When we consider the subject of static electricity we are considering therapeutic possibilities beyond our ken; we are simply in the dreamland of electro-therapeutics. With our

modern machines and appliances we are enabled to accumulate enough energy to almost knock one senseless; or the same energy may be so broken up and distributed as to make it seem as light as a morning zephyr, and as refreshing as a mountain breeze. While the body may be subjected to a current of millions of volts, the periods per second running well up into the millions renders it absolutely safe. This latter current is known as the high-tension, high-frequency current from the static machine. From what is generally considered physiological reasons, when an alternating current reaches a certain frequency, the painful effect of the current gives way to a sensation almost imperceptible and pleasing. It would seem, however, that we might find physical reasons for this condition. These currents are also subject to the laws previously stated, and to Ohm's law, which states that "The current equals the electromotive force (voltage), divided by the resistance." Whereas in the galvanic and ordinary faradic current we are dealing with comparatively small potentials, in the static and high-frequency currents the potentials are tremendous, in the step-up transformers used for high-frequency currents.

High frequency and high pressure distribute the current so thoroughly that it does not send its full force through a circumscribed area; in fact, the air is full of the current, so that anywhere within the electrostatic field a vacuum tube will glow if held in the hand. Here insulation is no longer considered,—glass vacuum tubes, wooden rods, hard rubber, and glass rods to a slight degree; in fact, anything will conduct the current,—and while a shower of sparks may be obtained, large and small, they are not painful. The air is full of ozone, and everything in the room is more or less charged by induction. The resistance in the circuit is constantly cutting down the amperage, while the voltage is either increased or unchanged. The ordinary disruptive discharge of the static machine is the spark. A brass ball acts as an accumulator, the current remaining on the ball until enough energy has been accumulated, when a considerable charge overcomes the atmospheric resistance of several inches, and jumps to the opposite pole or to any object connected with the earth. A wooden ball of the same size offers so much resistance that the current comes away in a violet

or blue discharge, because enough current does not accumulate to form a spark. The same is true of other electrodes of various degrees of conductivity. All these various electrodes cause physical change in the discharge, as manifested by the different colors of the discharge, which in time will find their appropriate therapeutic place.

It can, therefore, be readily seen that a vast field for investigation and great possibilities are open to the static modalities, with their many and varied modifications. We must study our current and the apparatus producing it, as well as the patient and his peculiarities. Some patients are sensitive to the static currents, and are made quite nervous from fear thereby; the same patients may be benefited by the continuous current, and often, after taking treatment with it for a while, will then take one of the static modalities with great benefit. Conversely the static current may sometimes be very beneficially used when the direct current is either not well tolerated or has failed to cure. Therefore it is only by a close and constant study of the various currents as applied to the various individuals that one can hope to gain the greatest measure of success in electro-therapeutics.

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#### MEETING OF THE ROENTGEN RAY SOCIETY.

The third annual meeting of the Röntgen-Ray Society will be held at the Sherman House, in the city of Chicago, on December 10 and 11.

The past year has been so fruitful of results from the employment of the X-ray in therapeutics that that feature alone in the great city of Chicago is an assurance that the meeting will be an interesting and instructive one. Physicians regardless of their own employment of the X-ray should, if possible, for purpose of enlightenment attend the meeting.



DANIEL R. BROWER, M. D., CHICAGO.  
*President of the American Electro-Therapeutic Association.*

## **Editorial.**

### **MECHANICAL THERAPEUTIC AGENCIES.**

UNDER the above caption the Journal of the American Medical Association considers editorially the fact that "the followers of internal medicine have often continued to direct their efforts too exclusively to the administration of drugs, to the neglect of mechanical means." The writer then adds the following broad and comprehensive statement:

"For years the value of massage and gymnastic measures in the relief of various conditions have been known, but physicians have been slow to adopt them, and massage has most often been relegated to inexperienced persons, who are 'strong and can rub well.' This has furnished the opportunity for osteopaths to establish themselves by appropriating one of the old, well-established means of cure. Physicians continue to be chagrined by their failure to cure certain patients whom they have treated by drugs alone, whom later events have shown could be relieved by a masseur who goes by the name of osteopath. Baths of various kinds are also valuable therapeutic measures which have been neglected by physicians. The therapeutic use of electricity has been more generally utilized, but not to such a degree as its value deserves. Fortunately the uses of light and X-rays as therapeutic agents are being carefully worked out by men of recognized standing in the profession, and it is to be hoped that they may be kept in some measure from becoming the property of unskilled and illegitimate quacks.

"The rational explanation of the neglect of these mechanical therapeutic agents, if we may employ a rather unsatisfactory expression, by physicians lies in their lack of practical knowledge regarding them. If anything has been taught in medical schools concerning these matters it has usually been done in a very imperfect and superficial manner and only as an unimportant appendix to the other therapeutic instruction. It is highly desirable that students be given practical instruction by well-qualified teachers in these various subjects and that they be impressed with the idea that it is no more below the dignity of a physician to apply massage to an injured point or diseased muscle than to administer a dose of calomel or perform an amputation."

This position, taken by our esteemed contemporary, is reassuring, and denotes an energetic movement towards the adoption of these rational therapeutic measures. Too much stress cannot be laid upon the necessity of their addition to the curriculum of all medical colleges.

The disposition has been to ignore and speak slightly of the so-called forms of physical therapeutics, but the time has come when the display of such bigotry may be considered the undoubted "sign of ignorance."

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### **THE MEDICO-LEGAL ASPECT OF THE ROENTGEN RAY IN THERAPEUTICS.**

The growing interest in the employment of the X-Ray in the treatment of diseased conditions tends to place the practitioner in a compromising position whenever the effects resulting from its employment are questioned.

Many physicians have adopted the contract plan, the patient signing a release which shall exempt them from responsibility in case of burns. That such a course is prudent is self-evident; however, the suggestion to many patients will cause them to defer treatment, feeling that the risk must be great that demands such strenuous precautions on the part of the physician.

It is not the custom with the surgeon to demand such exemption when he employs anaesthetics or performs operations fraught with great risk, but to state verbally that there is in such operative procedures an element of danger, his reputation serving as his safeguard. In radiotherapy the rule obtains. If patients are without exception told that a dermatitis is almost certain to result, the burden of responsibility will be with the patient.

Experience has taught the radiotherapist that there is very rarely, if ever, under judicious management, a case beyond a second-degree dermatitis, which is serious only in point of delaying treatment.

To avoid litigation, then, it should not be necessary to require a release if the patient at the outset is apprised of the fact that a dermatitis may be expected—non-professionals alone, for whom there should be no protection, could then be made to suffer.

## Progress in Physical Therapeutics.

### GYNECOLOGY AND APPLIED METALLIC ELECTROLYSIS.

BY G. BETTON MASSEY, M. D., PHILADELPHIA, PA.  
ASSISTED BY MARY L. H. ARNOLD-SNOW, M. D., NEW YORK.

#### *The Electrical Treatment of Extra-Uterine Pregnancy.*

It must be admitted that less attention has been paid of late by gynecologists to the electrical treatment of ectopic pregnancy, though the method is doubtless still used by conservative workers in this specialty who are not conspicuous writers or speakers. The present race of gynecologists is of course intensely interested in major surgery, and it is therefore not to be wondered at that scant attention is paid to a procedure of this nature. The early claims for the method, also, were too extensive in the particular that no reservations were made concerning contra-indications in cases in which intraperitoneal rupture had occurred, or when the age of the fetus was too great to permit of a complete absorption of the devitalized products of conception.

The electric treatment of extra-uterine pregnancy is of American origin, Allen of Philadelphia having been the first to employ it. The ultimate fate of the patient in this apparently successful first attempt is also instructive as to the limitations of the method, for Dr. Allen personally related to one of us that years afterwards this patient, a colored woman, was somewhat lame from the effects of retained fetal remnants in the pelvis, passing, if we remember correctly, fragments of bones per rectum. That ossification had advanced so far indicates that the age of the fetus was beyond the period now advocated as the proper one for the electric treatment not followed by abdominal or pelvic operative removal.

Later experience indicates that the fetal growth shall not have passed the fourth month to make the case a proper one for sole reliance on electricide, and that it must be either a case diagnosed before rupture, or after rupture within the broad ligament. In either case repeated applications of the galvanic or faradic currents through the sac, per vaginam, will be followed by death of the fetus and complete absorption of all products of conception.

This narrowing of the field of electricity in this condition leaves, however, a most important work to be done, in which lives may be saved from the dangers of an unnecessary

major operation, and ovaries also saved from needless destruction. The argument that the tube and ovary on the affected side have been rendered useless remains to be proven. In the writer's own experience complete apparent restoration has occurred in a number of instances. The further argument that a second abnormal pregnancy may occur in the diseased tube is merely fanciful in the face of the possibility of curing the catarrhal tube by a proper after-treatment, and is more than offset by the greater probability of unpleasant after-effects of the abdominal section, such as bowel obstruction or hernia, aside from the dangers of the operation and the effects of the partial castration.

What is, then, the duty of the scientific and conscientious physician when he discovers that his patient has a rapidly growing, tender, elastic tumor in the tubal region, with evidences of a beginning fetal existence so dangerously placed? Surely it is to arrest the progress of the misplaced fetal sac at once, and it has been demonstrated that this can be done by passing currents through it without danger to the mother, by the simple vagino-abdominal method. This can be done anywhere, in the backwoods as well as in a well-appointed hospital—but its value is by no means limited to instances in which the services of a skilled surgeon are unavailable, for, aside from the possibility of a complete cure by absorption, in cases occurring before the fourth month of gestation, the immediate arrest of fetal vitality makes subsequent operation distinctly safer, in lessening the chance of hemorrhage during removal.—G. B. M.

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#### *Electricity in Gynecology.*

On the general questions at issue Dr. W. A. Minick of Wichita, Kas., has the following remarks:

This agent in the treatment of diseases incident to the female organs is too much overlooked or underestimated. If we are able to understand the electrical currents and the proper mode of their application to the diseased organs, and use our knowledge of them judiciously, there is no question as to the good results attained. Physicians of to-day do not recognize the therapeutic value of electricity as in former years. The knife has practically supplemented all therapeutic applications and the results obtained by them have been forgotten. There is a mania nowadays which has become a real epidemic among physicians to see how many laparotomies they can add to their list. After a superficial examination and without even making a diagnosis and giving to the patient a favorable or unfavorable prognosis they immediately proceed to perform an operation which results, possibly, in the continuance of life and the relief of the trouble, though certain to unsex the woman and leave her a prey to the

mental degeneration that seems to follow oophorectomy. That ablation or amputation is the only resort worthy of a surgeon is certainly a novel proposition, admittedly untenable in reference to any other part of the body; until they demand the removal of the testicles in every case of orchitis we should look upon their present condition with suspicion. We hope to see some conservative reaction from this unwarranted attack upon the abdominal cavity, and we predict with all confidence that in the near future more conservatism will be shown to suffering humanity.

That the removal of the appendages, and even the womb itself, is occasionally required, is very certain, but the writer is not prepared to believe that the thousands of cases annually reported present conditions that bring them within this class. There are many difficulties surrounding the differential diagnosis between ovaritis, salpingitis, and parametric inflammation with cellulitic deposits, and early uterine pregnancy. Difficult though it be, that abdominal section should be performed for the purpose of settling the diagnosis, is unprofessional and unwarranted. We believe, and our experience has proven, that electricity, properly applied, will make the diagnosis more easy of determination, and not only so, but in a great majority of cases will cure the diseased and inflamed organs.—*Medical Arena.*

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*Pervaginal Mercuric Cataphoresis.**To the Editor of ADVANCED THERAPEUTICS:*

Sir: Will you kindly give the details of the method of employing mercuric cataphoresis, as referred to in "The Case of Mrs. D.—A Study in Contemporary Gynecology," ADVANCED THERAPEUTICS, Vol. XX., p. 31, January, 1902.

Reply.—The method is very simple, consisting in the employment of a large uncovered brass or zinc vaginal electrode, preferably zinc, freely coated with mercury, as the positive pole placed in the vault of the vagina nearest the inflamed tube or ovary, the indifferent pad being on the abdominal surface. The electrode is preferably shaped like a pigeon's-egg, and should be at least as large as the latter, with a well-insulated shank. A new zinc or brass electrode will readily become freely amalgamated with the metallic mercury or quicksilver by first dipping it in weak sulphuric acid and then into the mercury. If the brass or copper instrument has been nickel-plated the plating should first be removed by dipping into sulphuric acid of full strength. The

instrument should be freshly amalgamated before each application. Five minutes daily or tri-weekly, with currents of forty to seventy milliamperes, will usually suffice, and the resultant erosion of the vagina will usually demand the occasional intermission of the treatment, which, however, should be persisted in for months if necessary, to cause resolution of the inflamed organs. True pus tubes can unquestionably be cured by this method, the tubes ultimately draining through the uterus, while old cases of pelvic peritonitis are greatly improved. It is probable that the diffused mercuric salts (oxychlorids) exert a profound influence on the neighboring organs also, since an influence has been noted on the menstrual function in a number of cases, a temporary suppression occurring at the second or third months of treatment. No general mercurialization results.—G. B. M.

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## GENITO-URINARY DISEASES.

EDITED BY ROBERT NEWMAN, M. D.

*Sterility in Male Cured by Galvanism.* Gust. Bloch, Philad.  
Med. Journ., December 7, 1901.

The writer reports only one case, in which the sterility was due to dead spermatozoids, in a man of good habits. Galvanism was applied, the negative pole to the prostatic urethra, and the positive pole was placed on the back; five to twelve milliamperes for five to eight minutes were used. Twelve séances cured the patient, says the report.

*Sexual Impotence and its Electric Treatment.* A. Laquarriere, International Medical Magazine, September.

This is an exhaustive paper, which has been translated from the French for the journal. The treatment has to be selected according to the cause, which may be a permanent deformity, or a disease of one part of the generative organs, but in most cases is from an excess of sexual concourse, or masturbation, which is worse. The treatment by electricity is in most cases beneficial or curative, but may fail, if the centers in the spinal cord have been injured or destroyed to such a degree that regeneration is impossible. Another category may be designed by the term "impotences of nervous origin," for which electricity may do much.

Psycho-therapy may assist the treatment, but can scarcely cure the difficulty.

The continuous (galvanic) current, used by placing the

positive pole on the perineum and the negative on the loins, according to the method of Stevenson, which is often so remarkably successful in various urinary troubles, is of all these procedures the most frequently successful, and it is particularly useful to lessen reflex irritability and to retard premature ejaculation.

According to Tripier there is an antagonism between the cerebral and spinal centers and the anaphrodisia in simple cases, the result of the predominant inhibitory action of the cephalon upon the cord; so that impotence may be due either to depression of the cord or exaggerated activity of the cerebrum.

Apostoli has used very strong currents.

It seems advantageous to use as high intensity as possible, for it is certain that, the electric diffusion remaining the same, the organ which it is desired to influence is traversed by a current which is stronger in proportion to the strength of the whole current traversing the organism. The use of large electrodes gives better results, and it seems well to seek to act at the same time upon the cord, the nerve roots, and the abdominal plexus.

In conclusion it may be said that ascending volatilization of the cord increases erection in those subjects who have weakness of this faculty; and also that we should try this procedure in sexual impotence, whether we desire an agent curative in itself or whether we wish only to restore the patient's confidence in himself and to furnish a foundation for the psychic treatment which is necessary in most of these cases.

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*The Diagnosis and Therapeutic Value of Ureteral Catheterization.* L. Gross, New York Medical Journal, September 13.

The author reviews the history of this procedure, reporting one case in which a diagnosis of pyelitis of the right kidney was made. Irrigations into the pelvis of the organ and into the bladder with ten grams of a 1-1000 silver nitrate solution cured the case. The author's views as to the status of the method are thus expressed: Diagnostic Value: To determine (1) whether the bladder or the kidney is the seat of the affection; (2) the presence or absence of a kidney; (3) which kidney is involved; (4) the site of the lesion; (5) the functional capacity of each kidney; (6) the presence of a calculus in the ureter or pelvis of the kidney and its exact location; (7) the presence of strictures in the ureter and their exact location; (8) the diagnosis and site of ureteral fistulæ; (9) the presence of a pyoureter; (10) a differential diagnosis between diseases of the kidney and the surrounding organs; (11) at times a tuberculosis of the kidney; (12) the diagnosis

of pyelitis, pyelonephritis, pyonephroses, hydronephrosis, movable kidney, neoplasms of the kidney, or renal lithiasis; (13) abnormal congenital conditions of the ureter. Therapeutic value: (1) To cure pyelitis and certain cases of pyonephrosis and hydronephrosis; (2) to drain pocket formations; (3) to dilate strictures of the ureters; (4) to dislodge small calculi of the ureter; (5) to drain the kidney after nephrotomy; (6) to prevent injury to, and stitching together of, the ureter in certain operations; (7) to prevent and cure renal fistulæ; (8) as a guide to certain operations on the pelvis of the kidney. Strict asepsis robs the method of any danger of infection.

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*Note on the Origin of Urine Albumin.* Ludwig Aschoff,  
The Lancet, London, September 6.

From his experiments, made by injections of serum and kidney substance of rabbits into guinea-pigs and of guinea-pigs into rabbits, Aschoff finds that the results tend to confirm Mertens' experiments and to support the view that the albumin present in nephritic urine is different from the specific kidney albumins.

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*Treatment of Chronic Gonorrhea.* J. Cohn, Die Therapie der Gegenwart, Berlin, August.

The gonococcus burrows into the depths, and consequently treatment to be effectual must first dislodge it. Cohn has found that this is best accomplished by preliminary dilatation of the urethra, which is a kind of massage. The chief danger in chronic gonorrhea is the participation of the prostate in the process, and especial attention should be paid to prophylaxis of this complication.

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## LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

EDITED BY W. SCHEPPEGRELL, A. M., M. D.,

*Adjutants to the Drug Treatment of Diseases of the Eye.*

While the accurate prescription of the indicated drug must ever occupy a leading place in the treatment of disease, Dr. Charles Deady of New York (*Journal of Ophthalmology, Otology, and Laryngology*) reminds us that experience soon teaches the physician that, if he would obtain the best possible results, something beyond this is requisite, and the man who, in addition to a thorough knowledge of *materia medica*, brings to the aid of his patient the beneficial effects to be derived from proper hygienic surroundings, appropriate diet, and the various local measures suggested by careful

observation, will be more successful than he who relies upon drugs alone.

In all diseases where conjunctival discharge is present cleanliness is of the first importance. In purulent, croupous, and diphtheritic conjunctivitis it is absolutely imperative, and the degree of its observance will often tell the story of success or failure. In these cases the discharge is profuse and more or less toxic; if it is allowed to lie in contact with the cornea, the nutrition of which is already below par from choked circulation due to the conjunctival swelling, the delicate epithelium becomes macerated and breaks down, and once deprived of its protective coat the cornea soaks up pus like a sponge, breaks down into a slough, and the eye is lost. Here ordinary cleanliness is not sufficient; the eye must be kept free from pus day and night. If it is necessary to cleanse and disinfect it every fifteen minutes or oftener, it must be done, even if it deprives the patient of sleep for a time. These cases, if properly treated, seldom last long enough to make loss of sleep a serious matter to a patient lying in bed constantly, and the danger to the cornea admits no alternative. In the ordinary varieties of conjunctivitis it is necessary to keep the eyes clean for another reason. If the discharge be allowed to remain the lashes become glued together, causing irritation at the roots of the ciliæ, which may later on result in a troublesome attack of inflammation of the edges of the lids, or blepharitis.

In many cases it is not sufficient to bandage the diseased eye only; sometimes the motions of the free eye or the effects of light upon it are sufficient to cause much irritation of its diseased fellow, and we may be obliged to close a perfectly well eye in order to protect its mate.

Bandaging is contra-indicated where any amount of discharge of mucus or pus is present. By confining the discharge, irritation is set up and the case is aggravated; even serious ulceration of the cornea may result from improper handling in this respect.

In using ice upon the eye one cardinal principle must be carefully observed; the eye must be closely watched, and at the first sign of breaking down, impaired luster, cold applications must be discontinued. Our effort is to stop the progress of the disease before the nutrition of the cornea is seriously affected; after that condition obtains this means of treatment is worse than useless, as it further prejudices the case by reducing circulation and, consequently, corneal nutrition.

The use of moist heat is almost entirely confined to cases where pus is present, and it is generally applied in the shape of a poultice. A flat muslin bag about three inches square is prepared, with an opening left in one corner; this is about

half filled with fresh-ground flaxseed, the opening closed and the bag placed in cold water, which is then heated on a gas stove. If placed at once in hot water the contents of the bag dissolve and escape, but by placing it first in cold water the contents swell and close the pores of the bag. By having two or three of these bags they can be changed sufficiently often to preserve a uniform high temperature of the affected part.

In hospital practice we find the poultice very useful about the time of the national holiday, when we invariably have a crop of cases due to the use or misuse of gunpowder. These patients come in with the lids, cheeks, and foreheads filled with grains of powder, as well as the cornea. In the latter it is not well to attempt much in the way of removal, because the result is to stain the cornea badly, and as gunpowder is antiseptic there is no great danger in leaving a few grains, more or less. On the skin, however, we obtain excellent results by poulticing the parts, which causes suppuration about the grains and renders them easily removable, besides reducing the pain and swelling.

In certain conditions of the eye, massage has attracted much attention during the past few years. It is a means which I have long used, and often with great satisfaction. In chalazion it will, if persistently used, often dissipate the tumor. In iritis, in which strong adhesions have formed, I have many times succeeded in at least partially breaking them down by its use in conjunction with a strong solution of atropin (often the crude drug) and the internal use of merc. dulc. ix or 2x (calomel), the latter to induce (if possible) fatty degeneration of the adhesive lymph.

The importance of re-establishing the circulation between the anterior and posterior chambers is so imperative, if we are to preserve the integrity of the eye, that no efforts should be spared to accomplish it, and vigorous massage of the ball, however painful, should be persisted in so long as there is any hope of success.

Electricity is too large a subject to be treated in a paper like this, but its importance is so great that its omission would be inexcusable. When intelligently used it is one of the most potent factors in the treatment of disease. By carefully individualizing our cases we may by this means accomplish seeming impossibilities.

To generalize broadly; in acute inflammatory processes use the galvanic current with the positive pole to the eye, the negative to the wrist or hand. In chronic cases, when absorption is desired or it is necessary to stir up the part to induce reparative action, use the galvanic current, the negative pole to the eye.

In conditions where a more tonic action is indicated the faradic current will usually accomplish all that is necessary.

In all cases apply the current fifteen to twenty minutes, and have it as strong as can be comfortably borne by the subject.

While touching upon electricity it may be well to speak of the use of the electric cautery as a means of sterilizing and stimulating asthenic ulcers of the cornea. The old method was to scrape the surface of the ulcer with a sharp scalpel or cataract knife, and by removing all necrotic tissue to give nature a lift, as it were, to save her the time and effort required to cleanse the ulcerated surface ready for healing. By means of the electric cautery this object may be attained more quickly and certainly than formerly, and it is well worth trying in cases where it is indicated.

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*Bacteriological Diagnosis of Membranous Inflammation of the Throat by a Simple Method.*

The following simple method of making a rapid differential diagnosis bacteriologically is referred to by Dr. Francis Carey Bayne of Baltimore (*Journal of Eye, Ear, and Throat Diseases*, May-June, 1902).

Take an egg and boil until hard. Then with sterilized forceps break very gently into the air sac and peel off the shell and membrane immediately beneath it, leaving enough of the same to protect your culture. Make a swab from the throat and gently smear on the surface of the egg under that part of the shell which is left. Then take an ordinary cup and pass through flame very rapidly several times to sterilize. Place your egg in the cup with the broken end down, and leave by a stove for twelve hours. By this method is obtained an almost pure culture of diphtheria bacillus in from eight to twelve hours; this organism growing more rapidly than others usually present. You can then stain by Loeffler's method and get the typical staining reaction. I have tried this method a number of times and found it very successful and easy to carry out.

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## RADIOTHERAPY.

EDITED BY J. D. GIBSON, M. D.

*Epithelioma of the Orbit.*

Dr. A. T. Bristow, in Brooklyn Medical Journal of September, reports a case successfully treated by means of the X-ray. The patient was treated by Dr. J. A. Lee and had been in the county hospital for thirteen months and was unsuitable for operative interference.

Ten exposures were made, one every second day, before any change in appearance was noticed. Rapid improvement then

took place. She was treated without a shield, and only the diseased tissues were affected. The treatments were of fifteen minutes' duration on every second day until fifteen exposures had been made, after which twice weekly.

Dr. Delatour, in the discussion of the above case, referred to the cases of sarcoma reported by Drs. Skinner and Coley, in which the results were miraculous.

Dr. Bristow, like most surgeons, in spite of the results attending this case, took a rather gloomy view of the X-ray in the treatment of malignant diseases.

Dr. H. B. Delatour reported, during discussion of above case, a case of new growth of the transverse colon, which, in spite of a severe dermatitis, had markedly improved in appetite, weight, and general health.

Dr. Figueira divides recurrences of growths after removal of breasts into two kinds, those recurring in the cicatrix and those recurring in the deep muscles of the axilla. He considers the X-ray a specific in the first, but not nearly so certain in the latter class of cases.

[The editor of this department takes great pleasure in announcing the complete recovery with entire cicatrization of nice healthy tissue of a large epithelioma of the right temple. The case has now been dismissed for two or three months, and he reports himself entirely well and highly delighted with the results of his treatment. This case had been constantly under treatment with various plasters and pastes for two years, but no impression was ever made on it for good. It was reported at the last meeting of the American Electro-Therapeutic Association, and the prognosis given that he would recover, which we are now pleased to verify.—J. D. G.]

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## PHOTOTHERAPY.

EDITED BY MARGARET A. CLEAVES, M. D.

*Electric-Light Bath. System Physiologic Therapeutics,*  
Vol. IX.

J. C. Kellogg summarizes the therapeutic effects and modes of application of the incandescent-light bath as follows: 1. General and local revulsive effects, by dilating the cutaneous vessels. The reddening of the skin begins within a few moments and becomes more and more intense as the application is continued. The permanency of the effect may be increased by a short cold application following the light

bath. 2. Sudorific. It induces perspiration more quickly and more vigorously than any other agent, and with the least amount of inconvenience and discomfort. Care must be taken to protect the heart and the head by means of cold compresses. The patient should be made to drink water very copiously, both to encourage diaphoresis and to maintain the normal blood volume. 3. Promoting the absorption of exudates. Both general and local applications are valuable. In France the general electric-light bath has been used successfully in promoting the absorption of exudates in the cornea of the eye, vitreous opacities, and similar pathologic products. Kellogg has used with success in promoting absorption of exudates from the pleural and peritoneal cavities, and in and about the joints, general applications of the electric-light bath, combined with local applications of the light to the affected parts, and suitable hydriatic measures. A cooling bath is necessary after general applications, and the alternate spray or douche after local application to the joints, this to be followed by the application of a heating compress. The local application of light should be made at least twice daily, the general application once a day. The heating compress should be changed at least twice daily. Massage and, in some instances, electric applications to the parts, and especially to the adjacent muscles, are important adjuvants. 4. Tonic effects. No other means excels short applications of the incandescent electric light (three to eight minutes). A sensation of well-being, similar to that experienced by one who stands before a glowing fire, is pronounced, and when followed by a proper hydriatic application, the stimulation to nutrition is of the highest possible degree.

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*The Nature of the Regressive and Productive Tissue Changes that Lead to Cure, that Occur as a Result of the Influence of Finsen's Light Treatment in Lupus, Rodent Ulcer, and Nævus Vasculosus Planus.* Münchener medicinische Wochenschrift, July 8, 1902.

Sack, as a result of his studies, says that the blood-vessels are the first point of attack of the therapeutic light rays. Uncomplicated angioma of the skin shows this best. The skin is not burned nor cauterized, as none of the histological changes are found to resemble either of these processes. Certain cells only are acted upon and the process resembles microbosis. A retrogressive metamorphosis under the influence of light takes place in cells which are not hopelessly diseased, and he concludes therefore that the light rays must be regarded as a sort of physiological irritation.

## RADIOGRAPHY.

EDITED BY HERMAN GRAD, M. D.

*The Modern Treatment of Fracture of the Lower End of the Radius, as Indicated by the Röntgen Rays.* By Dr. Carl Beck, Medical News, September 20, 1902.

In classifying the different varieties of fracture of the lower end of the radius, it seems to me to be essential to distinguish: (1) Epiphyseal (chondro-epiphyseal and osteo-epiphyseal) separation; (2) fissure; (3) complete fracture (simple, without displacement); (4) complete fracture (simple or multiple, with displacement); (5) fracture of the carpal end of the radius associated with fracture of the styloid process of the ulna; (6) fracture of the carpal end of the radius associated with fissure, fracture or dislocation of the lower end of the ulna; (7) fracture of the carpal end of the radius associated with fissure or fracture of the scaphoid bone (sometimes also with the ulnar end). All these varieties may be intra- as well as extra-articular. (8) Fracture of little bone portions (chips), generally extra-articular.

Whenever displacement of the fragment takes place, accurate reposition is the condition *sine qua non*.

Then the modus operandi of reduction depends upon the type of displacement. In the majority of cases the lower fragment is directed upwards, so that there is dorsal prominence, the joint not being concerned. In such cases (generally called typical Colles' fracture) the shape of the deformed wrist resembles that of a bayonet or a fork. The Röntgen rays have shown, however, that the upward displacement as a rule is associated with sideway displacement, generally in an outward direction, causing radial inversion and consequently slight shortening of the radial axis. In such cases the clinical diagnosis is not difficult. The lower fragment pushes towards the dorsum, at which a prominence is seen, near the wrist, corresponding to a groove at the site of the upper end of the fragment. The upper (diaphyseal) fragment presses against the flexors, producing a prominence further upward. The greater the prominence, the shorter is the radial axis. Crepitus is, even in these typical cases, often absent. In a number of cases, however, the direction of the displacement is found to be towards the ulna, even if the diaphysis is not pronated.

There are also a number of cases observed by myself as well as by others, where the lower fragment is turned backward around the transverse axis. Sometimes the sagittal axis of the lower fragment is turned around. The oblique type (triangular fragment), in which the joint surface is split, has

been spoken of to above. A rarer form is the detachment of the posterior border of the joint surface. Roberts also observed forward displacement of the fragments. Most of these forms can only be diagnosticated by the Röntgen rays.

A fracture is a solution in the continuity of the bone, just as a wound is a solution in the continuity of tissues in general. The aim of modern wound treatment is union by first intention. The most important requirement for this end is, besides aseptic precautions, the thorough adaption of the wound surfaces.

No surgeon would expect agglutination if there be displacement, diastasis or overlapping of the wound margins. The same principle applies to the treatment of the margins of the bone fragments. It is true that manual coaptation is a little more difficult than suturing; still, under the guidance of the Röntgen rays it can almost always be accomplished. Before their advent it was usually the final result alone which told of the success or failure of treatment. That result was then a *fait accompli*, and the time for proper correction had passed.

Now, with our Röntgen light mentor we can tell from the very beginning what the result will be. If the "Röntgen mirror" reflects perfect coaptation of the fragments underneath the dressing, the final result must be good. There will be hardly any reaction; no exudation will form around the agglutinating surfaces, and consequently there will be no adhesions. Even in those cases, in which considerable displacement, or comminution, or both, have injured the soft tissues, little reaction follows within them, if reduction be thorough. And if reduction is impossible, the Röntgen rays point to those fragments which are to be removed shortly after the injury. This is preferable to waiting for months, exhausting all mechanical means, and finally arriving at the conclusion that the deforming fragments had better be removed. What I and many others have in former years often regarded as a callus was nothing but a projecting piece of bone-fragment in a displaced position. It may, perhaps, be a pardonable policy to adhere to this most euphonic term in the presence of the inquisitive and criticising patient, who has a dangerous desire of learning the cause of his gibbous wrist. But a scientific forum cannot ignore the occasional failure to reduce.

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*The Early Diagnosis of Pulmonary Tuberculosis by Röntgen X-Ray Method.* By Dr. M. K. Kassabian, Medico-Legal Journal, September, 1902.

Method of examination by means of X-ray. It is necessary that the skiagrapher should be fully acquainted with the conditions of the normal lung. A certain amount of prac-

tice and experience, and a thorough knowledge of the fluoroscopic picture of a normal chest are essential for the correct and successful use of the fluoroscope. There are two methods of examination, namely, fluoroscopically and skiagraphically. The fluoroscopic examination consists in placing the patient in a position in front of the Crookes tube (twenty inches distant), then placing the fluorescent screen over the chest of the patient. The clothing should be removed, so that both sides of the chest can be compared. The normal lung appears transparent to the examining eye, but when there is a diseased spot in the lung, the picture is that of a characteristic hazy and cloudiness. The diaphragm on the affected side can be seen to be somewhat lagging or impaired in its movement. The lung should be viewed, both at the end of the deepest inspiration and expiration. The patient should be viewed first anteriorly and then posteriorly, and both sides of the chest should be compared. Skiographic examination refers to the keeping of the shadow permanently on sensitive photographic plates.

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*Report on Radioscopy and Radiography of the Internal Organs.* By M. Grunmach, Archives d'Électricité Médicale.

The author presents his report and shows, in support, a series of very fine radiographs. Among these radiographs were congenital malformation of the heart, pericarditis with effusion, numerous aneurisms of the thoracal and abdominal aorta, visceral cancers, arterial sclerosis, divers bony lesions, foreign bodies of the esophagus, pleurisy, calcifications of the arteries, pulmonary cavities, tumors of the mediostinum, lesion resulting from old pleurisy, etc.

M. Grunmach insists upon the utility of instantaneous exposures so as to obtain clear representations, which will give a deal of information not obtainable by prolonged exposures. In order to obtain these radiographs, it is necessary to have very powerful coils having the capacity of giving eighty centimeters to one meter of spark, and tubes for cooling the anti-cathode by cold water.

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*Researches in Diseases of the Thorax by Means of the X-Ray.* By M. Weinberger (Vienna), Archives d'Electricité Médicale.

Examination by X-rays should not be utilized alone, but ought to be connected with other methods. The author investigates the services which the method may render and its defects, and how the latter may be avoided. He speaks suc-

cessively of the examination of the lungs, the heart, the large vessels, and the diaphragm. The mediastinum can only be satisfactorily examined by oblique lateral examination.

The author describes the topography of the radioscopic image, in relation to which he disagrees with M. Holzknecht. As for the examination of the vessels, it is necessary to utilize the oblique lateral examination.

M. Holzknecht.—I acknowledge that the pleuro-costal sinus cannot be examined in a horizontal position, and that this necessitates, as M. Weinberger says, an oblique examination from top to base.

M. Benedikt.—No one can form an absolute opinion as to the position of the heart.

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*A Stereoscope for Radiography.* By M. Walter (Hamburg), Archives d'Electricité.

If we reduce the images the details are lost; my stereoscope permits the image to be seen with either one or both eyes, without any effort and, consequently, does not cause fatigue. The perception of images of large dimensions necessitates, for their simultaneous vision, the divergence of both eyes. But if the left eye is used to regard the image to the right, and the right eye used to regard the picture to the left, the eyes are then convergent and fatigue is avoided. In a second form the author employs convergent mirrors, as in the stereoscope by Wheatstone, or prisms, as in Brewster's stereoscope.

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## THERMOTHERAPY.

EDITED BY CLARENCE EDWARD SKINNER, M. D., LL. D.

*The Use of Hot Air in Eustachian Catheterisation.* By Dr. J. F. Oaks of Chicago, in the Laryngoscope for September, 1902.

Although comparatively new the use of heated air in the treatment of otitis media has become a recognized and well-known method among ear specialists. My attention was directed to the use of hot air in the treatment of middle-ear deafness by the publications of Dr. Charles Enslee, a few years ago. I opine that the lack of interest in the use of hot air by the Enslee method, the merit and usefulness of which was generally admitted, has been due to the cumbersome feature of the apparatus and the expense of the outfit. For the past two months I have been experimenting with an unique apparatus, the invention of Dr. W. K. Seelye of Dubuque, Ia.

This apparatus, which I will call the "Seelye heater," consists essentially of a brass tube around which is closely woven a coil of wire of high resistance. Outside of this coil is a packing of asbestos, all of which is encased in a nickel-plated brass tube three-fourths of an inch in diameter and about two inches in length. The distal end is in the form of a metal tip of the size and form of the ordinary "cut-off" tip. The proximal end is made of black fiber so shaped as to be held easily with two fingers while the thumb rests against the cut-off, making the whole length of this very handy apparatus about 3 1-2 inches.

The wire used is of a kind which offers high resistance, generating heat, causing the inner brass tube to become sufficiently hot to heat the compressed air in its passage through it. All the metal parts are of brass and all joints are either spun together or screwed, there being no soldering.

The conducting cords are attached by a screw plug to the lamp socket. In the cord is introduced a single point button switch which is placed on the table within easy reach of the operator.

To operate the "heater" close the circuit by pressing button of switch for four or five seconds. The heater will then deliver air under ordinary pressure at the desired degree of heat for catheterization of the eustachian tube, and will retain the heat long enough to complete the treatment of one patient.

If greater heat is desired, as in Politzerizing with Pynchon's inflator, the current may be allowed to pass through the heater eight to ten seconds. In no case should the switch be left closed more than ten seconds, as the heat would become so great as to injure the apparatus. As a safeguard, the current should be turned off at the lamp socket when through with the apparatus for the day.

[The heater referred to by Dr. Oaks is made by Chambers, Inskeep & Co. of Chicago.—ED.]

In the beginning of our experimentation with the "heater" it was found that the silver catheter became uncomfortably hot at the proximal end, not only to the patient, but also to the operator. This was in great measure remedied by the fitting of a fiber tip to the proximal end of the silver catheter, which formed a non-metallic connection between catheter and heater, which lessened to a great degree the heating of the catheter.

The use of the H. R. catheter suggested itself on account of its being a poorer conductor of heat, but its too great flexibility and liability to lose its distal curve by the heat

employed, as well as the greater clumsiness of the instrument, has discredited its use in my hands. Chambers, Inskip & Co. make a metallic catheter covered by hard rubber which combines both rigidity of metal and the poorer heat-conducting quality of hard rubber. The caliber and lumen of this catheter are of ordinary size, and being flexible, its distal curve, if desired, may be changed as it can be bent almost as freely as a silver catheter.

I have found that the sensations of the patient and familiarity with the heater precludes the possibility of inflicting unnecessary pain or doing any damage.

It is not my intention at this time to enter into a detailed discussion of the merits and rationale of hot air, nor to enumerate in detail the cases treated. Nor is it necessary for me to emphasize the superiority of eustachian catheterization over other methods of middle-ear inflation in cases of chronic middle-ear deafness. Of one thing, however, I am quite sure, and that is that the use of heated air in eustachian catheterization is not only soothing to the patient and of therapeutic value, but that it is decidedly more agreeable than the shock from a cold blast of air formerly used. Observations made in the treatment of a series of cases of chronic middle-ear deafness disclose the fact that the improvement was more marked after each individual treatment with the "heater," and the progress toward recovery more rapid, and that the results were in some cases brilliant. To be sure, much better results were obtained in the hypertrophic than in the hyperplastic cases; yet it was noticeable that in a few cases where the prognosis from a pathological standpoint was bad and treatment pronounced as hopeless, the patient declared that there was subjective improvement, especially in the relief of that usually distressing tinnitus.

In view of the difficulty of introducing superheated air in the middle-ear cavity it becomes a matter of speculation as to the full value of the hot-air treatment above outlined.

In the series of cases I have thus treated I have used the "heater" in connection with tympanic massage and the use of the vapors of iodine, menthol, camphor, etc., by the intercalation of Pynchon's modification of Buttle's inhaler (charged with a piece of fine sponge, medicated with a few drops of a mixture of equal parts of menthol, camphor, tincture of iodine, and chloroform) between catheter and "heater."

In all cases the nose and naso-pharynx received appropriate treatment. The treatments were given at intervals of two or three days.

In conclusion I wish to call attention to the charming effect of using the "Seelye heater" and the Pynchon inflator (with the medicated sponge) by Politzerization, for the

persistent otalgia and annoying fullness during the convalescent stage of an acute otitis media.

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## HYDROTHERAPY.

EDITED BY CURRAN POPE, M. D.

### *The Effect of Cold Water.*

The general application of cold water applied to the entire cutaneous surface produces at once a sensation of cold and, to a certain extent, a shock. This effect is directly proportional to the temperature of the water and also inversely proportional to the temperature of the preceding thermic application. That is to say, that if we have previously been making an application of a heating procedure, or have applied hot water to the surface, a given temperature of cold water will, by contrast, feel colder, though it does not produce the amount of shock it would ordinarily if it has had these precedent measures. As the cold water strikes the skin there is a slight shivering, followed by a check or pause in the respiration, followed immediately by a deeper and prolonged inspiration. The first action is a contraction of the capillaries of the surface and the unstriped muscular fibers of the skin, producing pallor and the ordinary "goose skin" of the laity. If the application is prolonged beyond a short period, and the patient has been trained by previous procedures and treatments, reaction may take place in the bath, though this is not usual until after the cessation of the application. The pulse rate and heart action is increased and the second sound of the heart more accentuated, and as a result of the contraction of the superficial blood-vessels the general blood pressure is raised considerably.

The general vascular phenomena incident to the application of cold water are due mainly to nervous influences acting through the vasomotor nervous system and through reflex stimuli conveyed from the periphery to the central nervous system. Upon the respiration its action is to increase the extent and depth of inspiration, and as a secondary result of this, increased absorption of oxygen takes place and a greater quantity of carbon dioxide is eliminated.

A practical point that might be mentioned at this place is to compel patients to keep their mouth open instead of closed, as the increased inspiration of air tends to do away with the sensory impression of more or less respiratory oppression, and it likewise hastens reaction. The commencement of reaction is the experience of an agreeable sense of well-being and pleasure, of a general sense of increased vitality. The

first observable effect is a reddening of the skin and an increased sense of warmth, and sometimes even to the extent that it can be objectively felt by the attendant. The respiration now becomes easy and of considerable depth, the extremities show the increased blood circulating in the periphery by the enlarged condition of the veins. The patient experiences a capacity for more and active exertion. Reaction is modified by the temperature of the water, the extent of surface treated, the duration of the application, the force of impact of the water, and the subdivision of the stream. Reaction is further assisted by voluntary movements and friction of the skin with the hand or by a coarse towel. Reaction varies in a great many individuals and is modified by pathological processes and by the previous habits of the individual with regard to cold bathing. In strong, healthy individuals it is prompt, extensive, and accompanied by the sensation above described. Where the individual is strong, active, and robust, and where he is the habitual user of cold water, the initial shock is even pleasant and the reaction prompt. After a certain period, varying in different individuals, perspiration ensues, accompanied by the continued subjective sensation of dermal heat. As the result of the application of cold, urea is much increased and uric acid diminished. This is probably due to the fact that with increased oxidation, circulation, and elimination, uric acid in the blood and in the tissue is oxidized and converted into the terminal products of carbon dioxide, water and urea. The quantity of urine eliminated is increased and the action of the intestinal viscera much enhanced, probably due to increased peristaltic action and secretion.

Among the marked effects of cold-water applications is the gain in appetite and a capacity for the digestion of all classes of food. The writer, after twelve years' practical application of this agent, does not hesitate to state that in all atonic conditions of the digestive system, accompanied by hyper- or hypochlorhydria, it is unparalleled and unequaled as a regulator of secretory disturbances in these viscera, and that in thoracic and abdominal manifestations of nervous disturbance, in all autotoxic and katabolic disturbances it has not its equal. The writer does not here dwell on the antiphlogistic action of cold water, as he will treat of its application when he comes to consider the general application of hydro-therapeutic measures in the treatment of febrile states.

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Putnam and Fitz (*Boston Medical and Surgical Journal*, March 15, 1902) report the result of experiments to determine physiologic effects of different kinds of baths and note that hydrotherapy exercises strong influence on the force and rapidity of the heart action and the control of the vaso-motor changes of the blood-vessels. The conditions tested

were those of neurasthænia, tabes, paralysis agitans, neuritis, and other forms of nerve troubles. They have found the treatment especially valuable in neurasthenia, using so-called tonic baths, and in paralysis agitans and spinal diseases have noted improvement of symptoms and general nutrition.

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Wharton Sinkler, in the *Therapeutic Gazette*, says that hydrotherapy is a means which has been undeservedly neglected in the treatment of functional disorders of the nervous system. In neurasthenia it is the most useful adjuvant and is often alone the means of restoring the patient to health. Like all other remedies, in order to get the best results from its use one must be provided with suitable appliances for its proper application and have experience in its administration. It is an agent that requires scientific accuracy and medical supervision. The most satisfactory treatment he has found is the hot-air cabinet (the editor prefers the electric-light bath), followed by the circular, needle, or rain bath for one minute at a temperature of 100°, gradually reduced to 85° under a pressure of twenty pounds. The Scottish douche is also lauded. The keynote of success, he believes, is watching the patient's reactive power. Heat and friction should be applied after the bath to promote this end. Insomnia, nervous dyspepsia, and other functional conditions respond better than to any known drug treatment.

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## DIETETICS.

EDITED BY SIGISMUND COHN, M. D.

*The Modern Basis of Dietetic Treatment in the Uric Acid Diathesis.* By Alfred C. Croftan, M. D., Chicago : New York Medical Journal, November 1, 1902.

Although nothing is known about the primary cause of the uric acid diathesis, the author accepts, besides a chemical and a physical basis, also a nervous factor in the ætiology of this disease. But the neurosal element is vague and hardly remediable, while the perversions of the uric acid chemism are more definite, and amenable to correction by dietetic treatment. Still, much confusion exists in this field. Many theories have been formulated, and different methods of diet have been recommended, only to prove a failure when tried at the bedside. A real, rational therapy is only possible if there is a full understanding of the fundamental perversions characteristic of the uric acid diathesis. According to the author these characteristics are: (1) An increase of uric acid

in the blood; (2) crystalline deposits of sodium urate in certain necrotic tissues.

I. The causes for this increase of uric acid in the blood the author again divides into three groups, as follows:

(a) Increased formation of uric acid; (b) decreased destruction of uric acid; (c) retention of uric acid.

All or several of these causes may be combined. The increased formation of uric acid is generally analytical, *i. e.*, by disassimilation of more complex compounds, the common mode of formation in man. We know to-day that only a specific kind of conjugated proteids (the nucleins) have as their end product of retrogressive metamorphosis, uric acid, and not urea. The nucleins, which are the chief constituents of all cell nuclei, will be found in all tissues rich in cell nuclein, brain, thyroid gland, lungs, liver, kidney, etc. If those tissues are contained in our food we will get an increase of uric acid in the blood and urine, and this source of uric acid we can control by excluding the nucleins from the food. But, on the other hand, a person may be fed for a long time from a diet perfectly free from nucleins, and may still excrete considerable quantities of uric acid. Here the uric acid is derived from the nucleins of the living tissue, and cannot be controlled. Some authors call this "Nucleolytic auto-intoxication."

b. The decreased destruction of uric acid is, in the opinion of the author, a more prolific cause of uric acid accumulation than overproduction. Normally uric acid is partly destroyed or transformed in the human organism. Experiments made by the author and others with extracts from liver, muscle, kidney, etc., have shown that they possess a power of converting uric acid into more highly oxidized, and more soluble, nitrogenous bodies.

c. The retention of uric acid is difficult to ascertain. Determinations of uric acid are only of value if the patient is kept on a diet free from nucleins during the time of observation; then we have to find the individual uric acid secretion. Real retention of uric acid will only occur in a small minority of cases of gout, in which there is distinct granular atrophy of the kidney's, and in the cases of "latent" nephritis, where albumin is absent, but increased arterial pressure is found.

II. The deposits of crystalline sodium urates in necrotic tissues, if found in the body, are a characteristic of uric acid diathesis. These uric acid concretions can only occur if the blood contains an excess of uric acid in solution. Certain factors must, therefore, be operative to favor the deposition of urates, and select certain locations, as joints, tendon sheaths, etc., for this precipitation of sodium urate crystals. One of these factors has been supposed to be a reduced alkalinity of the blood, but recent determinations

have not confirmed an abnormally low alkalinity of the blood in uric acid diathesis.

A much more important factor is the changes in the relative proportion of salts (chiefly mono- or di-sodium phosphate) in solution in the serum. If several salts are present in the solution, the more soluble salt will precipitate the less soluble one, even if the solution is not saturated with the latter. Given, therefore, an increase of urates in the blood, these urates will be precipitated if they come in contact with the relatively more soluble salts.

Having thus determined the fundamental perversions characteristic of the uric acid diathesis, the author presents two chief indications for the dietetic treatment. (1) To prevent the increase of uric acid in the blood; (2) to promote the solubility of uric acid either in the blood or in the concretions.

We have seen that the increase of uric acid is due to increased formation, decreased destruction, and retention. Therefore all treatment will be directed towards (a) reducing the production of uric acid, (b) increasing its destruction, and (c) accelerating its elimination.

(a) The production of uric acid is reduced by excluding from the diet all articles of food which contain nuclein; (b) to increase the destruction of uric acid other means of treatment than diet will have to be used to accomplish this end; (c) acceleration of elimination will be aided by improving the circulation and the renal excretion. Proper hygienic measures will enable heart and kidneys to perform their functions in a normal manner.

The dietetic regulations towards promoting the solubility of uric acid have as their first object the increase of the alkalinity of the blood.\* This is done either by giving alkalines or foods containing acid salts of organic acids, which are converted into carbonates in the body, and therefore act like alkalines.

On the other hand, all albumins contain sulphur, and many of them phosphorus. These two elements are oxidized to sulphuric and phosphoric acid, and therefore will reduce the alkalinity of the blood.

Aside from the alkalies, we possess certain organic uric acid solvents, among them urea.

Coming now to the special articles of food in the treatment of uric acid diathesis we will use them according to the general indications, as given above. (1) The meats. The author's opinion is that a moderate amount of meat is necessary, but care must be exercised in selecting the kind of meat, determining its quantity and mode of preparation.

\* This is not in accord with the author's statement that there is no abnormally low alkalinity of the blood in uric acid diathesis.

First of all, the administration of nuclein or extractives (uric acid, and the alloxuric bases) should be reduced. Liver, kidneys, sweetbreads, brain, thymus, are all excluded from the diet list. All meat extracts, gravies, etc., contain extractives and are forbidden. The flesh of fowl is allowed, as there is not much difference in regard to uric acid between white and dark meat. Boiled meat is better than roast or fried meat, because the extractives have been removed from the former. While a sufficient quantity of meat is necessary, on the other hand, too much meat is harmful. In the first place, meat produces a distinct digestion leucocytosis, followed by the disintegration of leucocytic nuclein. In the second place, as we have seen, the sulphur and the phosphorus of the meat will reduce the alkalinity of the blood by forming sulphuric and phosphoric acids. Corned beef is particularly bad, because all the basic salts are leached out, and replaced by neutral sodium chloride. In the third place the eliminatory powers of the kidneys will be overworked. Eggs in moderation are permitted. Milk is beneficial if it is not taken as an exclusive diet.

Cheese is poor in basic alkaline salts, which are dissolved in the whey, therefore the same objection is against cheese as in the case of corned beef.

Fat is not objectionable, as long as it does not affect the digestive faculty of the intestinal canal. The same can be said about the carbohydrates, which favor the development of dyspeptic disorders—on account of the easy way they undergo fermentation.

Vegetables and fruits.—Potatoes and cabbage are not so advisable, but salads, and green vegetables, with the exception of asparagus and other plants which contain much nuclein, may be given freely, because they contain a large proportion of acid salts. Celery and onions are forbidden on account of the irritating oils they contain. Tomatoes contain acids and are forbidden.

All fruits are permitted, because they contain acid salts which are convertible into carbonates and render the urine alkaline.

Spices and condiments should be avoided, because they stimulate the appetite and encourage overeating.

Beverages.—Water should be the chief beverage. But forced water-drinking is harmful. Excessive water-drinking does not increase the excretion of uric acid. On the other hand, the amount of water should not be reduced. It favors the formation of urinary calculi. One or two liters of water a day is the rule. Tea, coffee, and cocoa contain certain members of the group of alloxuric bases, and are partly converted into uric acid in the organism, therefore they have to be taken very moderately. Alcohol is a direct irritant

of the digestive tract, of the circulatory apparatus and of the kidneys, and therefore is better avoided.

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## PSYCHIATRY.

EDITED BY MAURICE F. PILGRIM, M. D.

### *A Case of Peculiar Sexual Life, Combined with Impulses and Phobia, Successfully Treated by Hypnotism. Essay of Geijustem, Hygiea, Stockholm, No. 1902.*

The case is that of a bookkeeper twenty-nine years old, whose psychical development had been normal up to the age of eleven. At that time, following the application of a bandage for kyphoscoliosis, he began to experience a feeling of anxiety and depression. A few weeks later he developed the following symptoms: an irresistible desire to commit some rash act, as to throw himself out through the window, strike his head against the wall, etc. On attempting to withstand these desires he would experience the greatest anxiety. After some time he discovered a unique method of relief, namely, the practice of masturbation. This afforded him temporary relief, both from the impulses and the anxiety which followed. He kept up this practice for fifteen years, masturbating as often as a couple of times a day or, at least, several times a week. Some time after the commencement of this practice he developed other symptoms. He was seized with attacks of dizziness, a sense of not knowing where he was, and an intense desire to rush home. As a result, he would not dare to go any great distance from home, this distance becoming shorter and shorter, until, at length, he would never venture more than a five minutes' walk from home. He also experienced great fear at being told of someone's death, avoided crowded streets, churches, and cemeteries, and was in constant fear of sudden death.

The patient's family history is negative except that his mother is a superstitious woman of a nervous temperament.

Dr. Geijustem first examined the case when the patient was twenty-six years old and noted the following: Patient's mental condition is very grave, he does not dare to leave the house, is forever tortured with above described sensations and a fear of sudden death. His intelligence is good, but there is something childish in his manners. He is interested in literature and music. In company he is quiet, is alone a great deal, and has no particular friend. The patient has a kyphoscoliosis in the dorsal region, with the upper convexity to the right. Reflexes and sense of touch are normal; sexual organs appear normal; nothing abnormal about internal organs. He has the general symptoms of a neurasthenic.

The author then tried to persuade the patient to accompany him out, but in vain. He then hypnotized him. While under the influence, the patient received assurance that he did not suffer from any disease which could cause sudden death, as well as suggestions to the effect that all his subjective symptoms would gradually disappear. After four similar treatments he was persuaded to go with the doctor out for a ride. On his way he was seized with an attack of the old symptoms, but after again being hypnotized at the doctor's home, he made his way back without further trouble. For the next two months he received in all forty treatments, after which time he was so much improved that he could go anywhere without difficulty. Towards the end of the same year the symptoms reappeared, but yielded to the same treatment. At the end of three months, being this time hypnotized in all twenty-eight times, he was better than he had been since he first took sick, his general neurasthenic symptoms having also disappeared. During his last treatment the author was first able to gain information as to the sexual condition of his patient. He found him entirely ignorant of all sexual things, and without a trace of passion. He showed no regret on being told of his sexual inferiority, nor had it been modesty which had kept him from telling the doctor, before, of his habit of masturbation. He was given instructions and, while under hypnotism, suggestions not to masturbate; he also ceased the practice from the day of his confession.

The most interesting feature in the case is the close relation which the impulses and phobiæ bear to the practice of masturbation. S. Freud has propounded an interesting theory in regard to sexual phenomena as the cause of anxiety. According to him, the somatic sexual irritation is led away from its psychical sphere and, taking an abnormal course, results in anxiety, with other accompanying symptoms. At first thought this case seems the reverse of Freud's theory—for, according to him, sexual irritation is the primary factor; in this case, on the other hand, the patient's symptoms are relieved by masturbation. However, if we remember that masturbation has not been caused by sexual desire, we can see how the impulses which gave rise to masturbation may be the unconscious primary cause or the analogue of Freud's "sexual irritation." Should we, therefore, apply Freud's theory to this case, we would have to say that the somatic sexual irritation, in this individual, has never given rise to sexual desire, but remained as a motiveless impulse.

As to the success of the treatment, it may be noted that, although his psychical condition can never be perfect nor his sexual life normal, yet he has been relieved of all his subjective symptoms and his working capacity has greatly increased.

[A word of caution is pertinent in respect to the work that is now being done along the lines of formal hypnosis. It is one of the steps—important but elementary—in the psychic treatment of disease. But it does not by any means comprehend the whole of psychiatry. More brilliant results are often times obtained without formal hypnosis than with it. The results are apt to be more permanent and more desirable in every way. Hypnotism illustrates the possibilities of psychic treatment and is valuable, but it is a lazy person's way of doing what with industry and patience could be better accomplished without it.—M. F. P.]

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### SOCIETY MEETING.

#### THE CLINICAL SOCIETY OF THE NEW YORK SCHOOL OF PHYSICAL THERAPEUTICS.

STATED MEETING OCTOBER 17, 1902, ROBERT NEWMAN, M. D.,  
CHAIRMAN

##### *Exhibition and Demonstration of the Application of Vibration and Mechanical Stimulation.*

Dr. Maurice F. Pilgrim of Boston exhibited this apparatus. He presented a case of scoliosis having two curves in the spinal column, which had been treated for a short time only by mechanical stimulation, yet with marked improvement. The patient was a woman, and had suffered intensely from dysmenorrhea for eight years. Her last menstrual period was the first in eight years that had been free from pain, even with a liberal use of opiates. Another case presented was one of goiter, in which by actual measurement there had been a reduction of at least two inches and a quarter. A third case was a neurosis,—nervous contracture with oscillation or an up and down spasmody movement of the head. This patient had also been greatly benefited by the vibration treatment from the very first.

Mr. Owens, the local representative of The Vibration Instrument Co. of Chattanooga, Tenn., by request, explained the apparatus more in detail. He said it had been designed to be used on any part of the body, and at the same time maintain the necessary rigidity. The apparatus consists of a heavy upright bar moving in a vertical direction so as to allow of the necessary adjustments. Connected with this is a long horizontal arm reaching over the patient and having various shaped terminals to facilitate the application of the motion of the machine to any part of the body. The machine

is actuated by an electro-motor. The action of the apparatus was shown upon a patient with scoliosis. The vibrating attachment was applied systematically over the course of certain spinal nerves. By a slight change in the terminal attachments of the instrument, it can be made to produce percussion. The effect of the treatment was often observed almost immediately.

Dr. Pilgrim: In the case of the lady with goiter, the application was made chiefly to the interscapular region on the general principle that the stimulation should be first applied to the sympathetic spinal center governing the nerves supplying the affected part. The application was next made to the axillary glands to stimulate and so increase drainage; and, lastly, to the goiter itself, to improve the circulation to that part. The patient happened to be suffering from a headache at the time of the treatment, and the headache was relieved in about one minute by stimulation applied to the occipital region. When the vibrating arm was applied over the region of the recurrent laryngeal nerve, it was found that unless this was done with care there would result a momentary, but distinct, depression of the heart's action.

The treatment was next applied to the nervous young lady already referred to, as suffering from a contracture.

Dr. E. A. Hults of Perth Amboy, N. J., said: I have used this instrument for about a month, and my interest in this work increases day by day. The instrument can be used very easily, and as a mechanical device hardly admits of improvement.

A man came to me to be relieved of the pain of acute rheumatism. He walked into my office with the shoulder and body bent over, and evidently in great pain. He was given one treatment about the back and shoulder, and when he left the office he put on his clothing without assistance and walked erect and free from pain. I have now under treatment several cases of constipation, one of neurasthenia, and another of goiter. The treatment is very pleasant, and my patients are becoming enthusiastic over the results obtained. The case of goiter is of eight years' duration. Treatment was begun about four weeks ago, and one week I was absent, so that she has only received nine treatments. The circumference of the neck over the goiter on beginning treatment was 14 3-4 inches, whereas at the present time it is exactly one inch less. The case is one of exophthalmic goiter (Graves' disease), associated with the usual rapid heart action and with dyspnoea, which symptoms have been rendered less intense.

Dr. C. E. Skinner: It seems to me that this instrument is worthy of close investigation for, when a goiter can be reduced, as we have seen to-night, it is evident that there is something in the treatment. Anything that relieves pain is worthy of consideration, and I know this instrument can do that, for

I have seen it. The underlying principle is that of stimulation of the spinal nerve centers. Its action is much in the line of that of static electricity, but the treatment is too little known as yet to say anything much of its capabilities.

Dr. Hults: The case of goiter I had under treatment had received treatment by static electricity for six months before coming to me without any apparent benefit.

Dr. Pilgrim: There seems to be a marked sedative effect in almost every case treated, no matter what the condition. I have myself taken the treatment, and certainly regretted that I was not allowed to remain on the table and go to sleep. I am speaking particularly of the application of the brush or of the ball to the spine. I know of two cases of insomnia which have been very much improved by this treatment.

In the treatment of the middle ear, the applications are made between the sterno-mastoid muscle and the trachea, just over the inferior cervical ganglion, in order to affect the sympathetics which have a direct bearing at this point on the middle ear.

In treating hemorrhoids, the attachment is first applied to the fifth lumbar and sacral nerves with a view to quieting pain and relieving congestion. Then the patient is turned upon his back, knees drawn up, and the lower part of the table is elevated so as to place the patient in a position somewhat similar to the Trendelenburg posture. Vibration is then applied to the liver and also over the iliac vessels, after which the patient is turned on his right side with the knees flexed on the abdomen. A special rectal attachment is then connected with the vibrator, and well lubricated before insertion into the rectum. By starting the machine before the introduction of the instrument, the latter is accomplished without pain. It is, of course, necessary to shorten the stroke of the vibrator arm.

In a case of palmar abscess which healed with much difficulty and left the fingers swollen and almost useless, massage was given on four successive days. At the end of that time the condition of the hand was a great deal worse, and it was then that the vibrator was brought into use. The first step in the treatment was to stimulate the lymphatics and drain the arm. Then we applied the attachment to the spine at the junctures of sixth and seventh dorsal vertebrae to stimulate metabolism, and then to the affected part itself. There was manifest improvement after the first treatment, and after about two weeks the hand was practically well.

In cases of varicose veins, the object of the treatment should be to stimulate the nerve supply and contract the vessels, and also to stimulate the glands of the groin rather than to make direct applications to the affected part. If the stimulation of the glands is omitted in a case, for example, of inflammation of the hand, the irritation is made, if anything, worse, but not

so if the glands are first stimulated. No matter how inflamed the part may be at the time, the treatment is soothing, and is not followed by irritation.

We have quite a number of other cases now under treatment; but I prefer to wait a little longer before reporting on them. To do so now would be premature.

Dr. William B. Snow: When this apparatus was brought here for our investigation, we appreciated the fact that there was much in vibration. I have been interested in the results which I have obtained during the past four years from the employment of the wave current. That current is largely of a vibratory character combined, as a matter of course, with the electrical effect. We are glad to give the proper place to any physical treatment apparatus of merit in our school. A large part of the results obtained with this instrument must depend upon the technique, as with the static machine. The method employed by Dr. Pilgrim seems to us to be unique in many respects. The idea of stimulating the cerebro-spinal and sympathetic centers and glands, thus favoring the unloading of an engorged part, is novel. I am frank to say that with the static machine I have not followed this plan, but it appeals to me. It is well worth while for us to carefully investigate this apparatus and treatment.

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## NEW AND IMPROVED APPARATUS.

This department is devoted to publishing, with illustrations, drawings, and descriptions, new apparatus, electrodes, etc., for the benefit of those interested in the progressive improvements in armamentaria.

### *Vibrator and Mechanical Stimulator.*

The accompanying is a cut of an instrument designed originally for the treatment of asthma.

The idea of constructing it so as to enable the operator to apply it to the nerve centers, as well as to the various organs of the body, was conceived and carried into effect by the Vibrator Instrument Co., of Chatanooga, Tenn., with the purpose in view of placing mechanical stimulation of the spinal nerve centers within the reach of the medical profession. The instrument is so constructed as to permit of its application to any part of the body, and at the same time maintain absolute rigidity.

The difference between vibration and stimulation consists in the length of the stroke of the vibrator arm and degree of pressure exerted by the operator, the arm being so constructed as to admit of both.

The instrument has special attachments, as follows, one for

the eye and ear, one for stimulating the spinal nerve centers, one for use in vibrating the abdomen and abdominal viscera, one for treating the rectum, and one for the vagina.



The motive power is electric, the motor, as shown, being connected directly to an incandescent bulb socket.

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—“Therapeutics of Dry Hot Air,” by Dr. C. E. Skinner, the first complete treatise published on this subject, has just been issued by A. L. Chatterton & Co. Cloth binding, \$2.00.

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